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Economic development through agrarian reform in the Central Sierra of Peru

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Iowa State University of Science and Technology, Ph.D., 1966
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ENRIQUE VIGUES-ROIG

1967

ECONOMIC DEVELOPMENT THROUGH AGRARIAN REFORM IN THE CENTRAL SIERRA OF PERU

by

Enrique Vignes-Roig

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
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1966

TABLE OF CONTENTS

	Page
I. INTRODUCTION -----	1
A. Agrarian Structures -----	1
B. Agricultural Development and National Economic Development ----	3
C. Defects in Agrarian Structures in Peru -----	6
D. Peru's Approach to Ameliorate These Defects -----	14
E. Need for an Analytical Model to Appraise Agrarian Structures from an Economic Point of View and for a Planning Model for Agrarian Reform Implementation -----	16
F. The Problem and Area Delimited for This Study -----	17
G. Objectives of the Study -----	18
H. Procedure Followed -----	18
I. Organization of This Report -----	19
II. AGRARIAN PROBLEMS WITHIN THE CENTRAL SIERRA OF PERU -----	21
A. Characteristics of the Central Sierra -----	21
1. Physical conditions -----	21
2. Economic conditions -----	25
3. Population conditions -----	29
B. Defects within Agrarian Structures Obstructing Development ----	38
1. Defects within Haciendas -----	38
2. Defects within comunidades -----	40
3. Related defects -----	43
C. Formulation of Hypotheses -----	52
1. Role of hypothesis in inquiry -----	52
2. Delimiting hypotheses -----	55
3. Diagnostic hypotheses -----	56
4. Remedial hypotheses and how these hypotheses will be tested -----	58
III. EFFICIENCY MODEL FOR TESTING AGRARIAN STRUCTURES AS TO THEIR ADEQUACY TO CONTRIBUTE TO THE ECONOMIC DEVELOPMENT GOAL -----	60
IV. ACTION PLANNING AND IMPLEMENTATION MODEL -----	79
V. THE APPLICATION OF THE MODELS TO THE 1964 AGRARIAN REFORM LAW IN THE CENTRAL SIERRA -----	92
A. Nature of the Agrarian Reform and Its Application to the Central Sierra -----	92
B. Use of the Efficiency Model to Test the Structures -----	104
C. Implementation Stage and Use of the Action Planning and Implementation Model -----	128
D. Alternative Solutions -----	141

TABLE OF CONTENTS
(Continued)

	Page
VI. SUMMARY, RECOMMENDATIONS AND CONCLUSIONS -----	156
A. Summary -----	156
B. Recommendations -----	159
C. Conclusions -----	161
VII. LITERATURE CITED -----	163
VIII. ACKNOWLEDGEMENTS -----	166
IX. APPENDIX -----	167
A. Articles of the Peruvian Agrarian Reform Law Relevant to the Preceding Study -----	167

I. INTRODUCTION

In less developed countries where most of the population is engaged in agriculture, defects in agrarian structures have been emphasized as obstacles to economic development of both the agricultural sector and the national economy. Agrarian reforms have been proposed, developed and applied as a major means for remedying these defects in agrarian structures in the pursuit of agricultural and national economic development.

This study deals with defects in agrarian structures within the Central Sierra of Peru. It also analyzes the current agrarian reform in this area being carried out under the 1964 Peruvian Agrarian Reform Law. Methodology for this analysis is developed and applied both (1) to the defects in agrarian structures and (2) to the remedies for these defects currently being attempted under the Peruvian Agrarian Reform Program. Certain conclusions are drawn regarding strengths and weaknesses of current efforts to improve agrarian structures.

A. Agrarian Structures

Economic as well as social activities are carried on under more or less rigid structures. These structures are the ways and means of accomplishing economic and social objectives under the sanction of law and custom.

Structures, however, might become obsolete due, for instance, to a substantial change of circumstances. When this is the case such structures defeat, totally or partially, the very purpose for which they were es-

tablished and hence become obstacles to progress.

It seems obvious that obsolete, useless or less suited structures should be changed and replaced by more suitable ones. Most structures, however, once they are accepted and consecrated by time, are not easy to change or modify. This is especially true when they have at one time proven to be useful and when their change might presuppose changes in other aspects of traditional life and upset vested interests of the ruling class.

Agriculture, which is one of the oldest economic activities, is carried on under a set of structures which had proven to be rather impervious to change. This is quite true in communities where rural people have lived for centuries on the same land and where the impact of industrialization has not had appreciable effects.

This is clearly the case of the agricultural structures in the Sierra of Peru, which have remained unchanged for centuries. This secular structural immobility has been the result, at least partly, of the lack of any appreciable exogenous force such as industrialization and of a positive interest of the ruling class to maintain the status quo.

Peru enacted an Agrarian Reform Law in May 21, 1964 (Ley 15037)¹ through which the nation intends to change the centuries old agricultural pattern. It is therefore of fundamental importance for the economic development of the country to establish new structures which, in the specific situation found in Peru, could help the country to develop its economy.

¹The Law has XV Titles and 244 articles, with two special dispositions, four temporal dispositions and a final disposition. A more detailed presentation of the parts of the Law relevant to this study will be given in the Appendix.

Many economists have either ignored structures as means for obstructing or facilitating economic change or they have largely neglected the analysis of the economic effects of structural change (29, p. 2) (33, p. 84). When agrarian reforms, which tend to change structures¹ enter into the picture, it takes some economists a little by surprise and leaves them somewhat unprepared to give answers as to the advisability of one structure rather than another. However, it is on decisions of this nature that rests heavily the greater or lesser success that agrarian reform might have in bringing about economic development.

B. Agricultural Development and National Economic Development

Economic development is defined as an increase in per capita real income and a distribution of such income among the factor contributors, that is, among everyone involved in the production process, according to their productivity contributions.

The agricultural sector contributes to the Gross National Product hereafter designated as GNP, at a varying rate depending on its importance in the total economy of the nation. In underdeveloped countries where the other sectors of the economy have not yet developed very much, the contribution of the agricultural sector to the GNP represents a high percentage

¹Though agrarian reform is being defined by various authors in different ways, the differences refer more to the scope of agrarian reform rather than to the essential elements of agrarian reform. At any rate, one essential element which is always present in the definitions is the change of land tenure structures.

of the total. Typically the expansion of other sectors, while reducing the relative contribution of the agricultural sector to the GNP, does not reduce at the same rate the relative number of active population engaged in agricultural activities. In Peru, for instance, the percentage contribution of the agricultural sector to the GNP in 1960, was approximately 22 per cent, while the active population in agriculture was approximately 60 per cent (1). Thus the productivity and per capita income of three-fifths of the nation's population engaged in agriculture was considerably below that of the remaining two-fifths. Furthermore, if structural defects distort the distribution of the agricultural income among the factor contributors, as is the case in most underdeveloped countries, a wider range of individual income takes place with serious implications for productivity, levels of living and purchasing power. A low per capita income of the large majority of the population lessens the expansion of the domestic market and consequently retards cumulative economic development.

The agricultural sector can induce economic development in the nation through its own development. This would consist of 1) an increase in production of agricultural products for which there is a market (domestic and/or foreign) and an improvement of the quality of such production, while at the same time the productivity of the production factors is also increased and 2) an increase in the demand for non-agricultural products by people engaged in agriculture as a result of improved purchasing power.

The effects of such agricultural development would be an increase in the income to the agricultural sector. Insofar as the prices that the consumers have to pay for the agricultural products are reduced, there would

be an increase of real income for the consumer group. This increase of real income might lessen the pressure for higher wages in industry and service sectors, and consequently, might reduce production and services costs, hence industrial products might become more competitive with foreign products in the national and international market. Likewise, the increase of real income would tend to expand the internal market for national industrial products because more money would be available to the consumer after the food needs are satisfied. At least in the beginning there would be also an expansion of the internal market for agricultural products if the development of the industrial and service sectors provides more people of the low income group with higher incomes.

Further economic national development would be created by an improved distribution of income among farmers which would encourage investments in the agricultural sector and eventually in other sectors of the economy. This would enable the rural population to participate effectively in the demand for industrial products and services.

Less foreign exchange would be needed for the import of agricultural products as the home production expands and consequently more foreign exchange would be available for other imports that might contribute to the economic development of the country. If conditions permit, the agricultural sector might also become a net foreign exchange earner through exports.

Further increase in the agricultural sector productivity would finally release production factors, especially labor, for employment in other sectors of the economy as employment opportunities become available.

C. Defects in Agrarian Structures in Peru

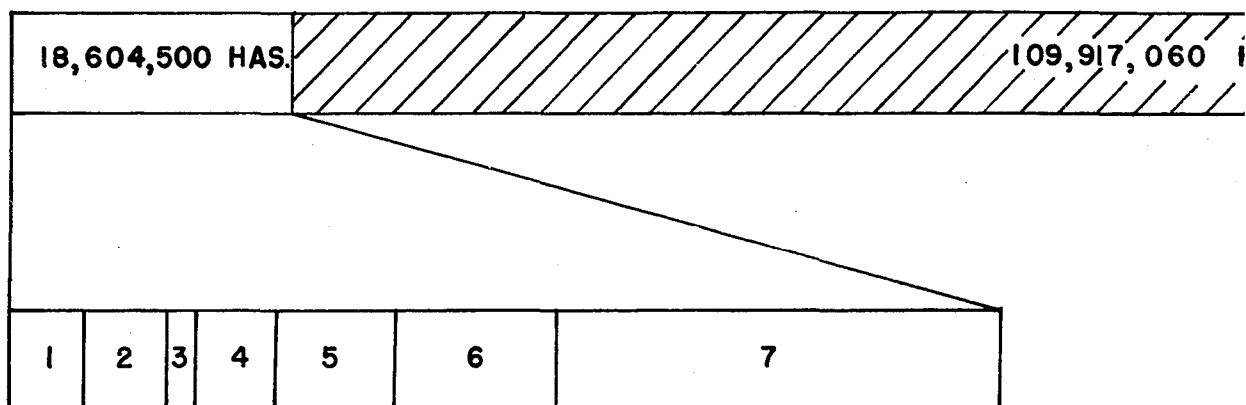
Statistical data in Peru, like in most of the less developed countries in the world, are at best only rough approximations. Since, however, data collecting is a major and difficult undertaking which oftentimes takes more time and resources than Peru has been able to afford, one is forced to operate with imperfect data. The "Primer Censo Nacional Agropecuario" (17) and "Estadística Agraria" (36) are the main and best sources of aggregate data now available to study the agrarian structures of Peru. On the basis of these sources the following data elaborations have been made.

The entire territory of Peru has 128,521,560 hectares (1 hectare = 2.47 acres) but only 18,604,500 hectares (14.48 per cent) are considered as agricultural land. Of these 18,604,500 has., 3,285,587 has. are unproductive,¹ 2,284,754 has. are forest and mountains (also unproductive), and 9,151,276 has. are natural pastures, generally very poor, which total 14,721,617 has. The remaining 3,882,883 has. is the amount of cultivated land.

This, however, is not completely true because 1,336,169 has. which are considered cultivable are in fact not cultivated² and another 500,000 has. are left fallow each year (455,123 has. were left fallow the year of the latest Census, 1961). (Figure 1.)

¹Unproductive land, according to the definition given in the "Censo" (17, p. xv) is the area under marshes, rocky land, and so on, which is not suitable for any agricultural use.

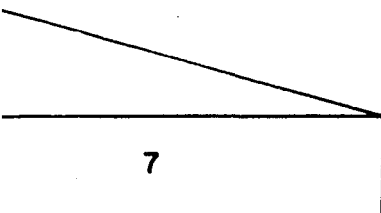
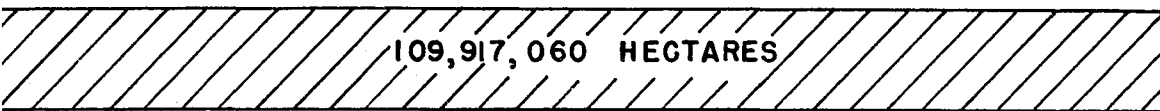
²The "Censo" from where the data are taken does not give any reason why this cultivable land is not cultivated.



1 - PERENNIAL PLANTATIONS AND CULTIVATED PASTURES	7,000,000
2 - LAND UNDER YEARLY CROPS	1,000,000
3 - LAND FALLOW	1,000,000
4 - CULTIVABLE LAND BUT NOT CULTIVATED	1,000,000
5 - FOREST AND MOUNTAINS	2,000,000
6 - UNPRODUCTIVE LAND	3,000,000
7 - LAND UNDER NATURAL PASTURES	9,000,000
TOTAL	18,604,500

FIGURE 1. AREA OF THE PRESENT AGRICULTURAL LAND IN PERU

(TOTAL TERRITORY OF PERU = 128,521,560 HECTARES)



TATIONS AND CULTIVATED	727,304	HECTARES
EARLY CROPS	1,364,287	"
	455,123	"
D BUT NOT CULTIVATED	1,336,169	"
UNTAINS	2,284,754	"
AND	3,285,587	"
TURAL PASTURES	9,151,276	"
TOTAL	18,604,500	HECTARES

SENT AGRICULTURAL LAND IN PERU (18,604,500 HECTARES)

RITORY OF PERU = 128,521,560 HECTARES)

With all preceding data considered, this leaves Peru with 2,091,591 has. of cultivated land (items 1 and 2 in Figure 1) which amounts to 1.63 per cent of the total national land area and only 0.16 has. of cultivated land for each inhabitant.

Estimates of potential farm-land and other land uses in Peru point to the following approximations: (23)

Land suitable for intensive agricultural production is 12,658,912 has. or 9.90 per cent of national land area.¹

Land suitable for forests and pastures is 40,663,293 has. or 31.8 per cent of the national land area.

Marginal land that is suitable for extensive livestock operations is 31,113,700 has. or 24.3 per cent of the national land area.

Land that is not suitable for agricultural purposes amounts to 43,566,027 has. or 34.0 per cent of the national land area (Figure 2).

The confrontations of the two sets of data just given, namely, the actual and the potential usable lands in Peru, provide a basis for several considerations about agrarian structures in Peru and their related problems.

a) If all the land actually used for cultivation in Peru could be classified as suitable for intensive agricultural production in the sense given by Oficina Nacional de Evaluacion de Recursos Naturales hereafter called ONERN (23) Peru would be at the present time using only approximately 16 per cent of its good land.

b) A substantial part of the land actually cultivated in Peru, most of the Sierra cultivated land, is not by any standard suitable for intensive cultivation. Consequently, much less than 16 per cent of Peru's land suitable for intensive cultivation is actually being used.

¹Approximately 30 per cent of it is in Costa which is very fertile if irrigated.

1	2	3	
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- 1) LAND SUITABLE FOR INTENSIVE AGRICULTURAL PRODUCTION
- 2) LAND SUITABLE FOR FOREST AND PASTURES
- 3) LAND SUITABLE FOR EXTENSIVE LIVESTOCK OPERATIONS
- 4) LAND NOT SUITABLE FOR AGRICULTURAL PUPOSES

FIGURE 2. ESTIMATES OF POTENTIAL AGRICULTURAL USE OF T

	3	4
--	---	---

AGRICULTURAL PRODUCTION	12, 658,912	HECTARES
AND PASTURES	40,663,293	"
E LIVESTOCK OPERATIONS	31,113,700	"
ICULTURAL PUPOSES	43,566,027	"

POTENTIAL AGRICULTURAL USE OF THE LAND IN PERU

c) On the basis of 16 per cent of the good land actually being used, Peru could support by her own means a population over 68 millions at current standards both of cultivation and levels of living, if Peru were able to place into use 100 per cent of its good land in the span of 60 years, which is the approximate estimated time for Peru to reach 68 million people at the rate of doubling her population every 25 years.

A few considerations should be noted on this point. First, Peru is not self supporting in food stuffs at the present time. Secondly, it does not seem realistic to think that Peru will maintain the present rate of population growth for the next 60 years. Thirdly, new lands are in the first years of cultivation more productive. Fourthly, it is unrealistic to expect that Peru will not improve her methods of cultivation in the years to come. And finally, it is also unrealistic to assume that the Peruvian population will not improve its level of living.

d) Estimates of the cost to place the potential land into operation have not been made. However, with the knowledge 1) that 30 per cent of that potential is in the Costa region and 2) of the high costs incurred in the San Lorenzo irrigation project, and 3) assuming most of the remaining 70 per cent is in the jungle where a basic infrastructure has to be built under very unfavorable physical conditions, it may be assumed that the price would be very high.

e) In Peru, 58 per cent of the total population largely associated with livestock raising and farming is living now in the low productive land of the Sierra.

The ownership distribution of the 2,546,714 has. of cultivated land, (items 1, 2 and 3, Figure 1), of which 356,313 has. are in perennial plantations and the remaining 2,190,401 has. are in yearly crops, cultivated pastures and land in fallow, which for convenience will be called here arable land, is as follows: 7,265 owners (individual persons, commercial companies and 348 Indian Communities) namely 0.83 per cent of the total land owners own 1) 756,671 has. of arable land (33.03 per cent of the total arable land) and 2) 140,073 has. of land under plantations (39 per cent of the total land in plantations).

On the other hand 871,401 owners (99.17 per cent of the total) own 1,433,730 has. of arable land (66.97 per cent of the total arable land) and 216,240 has. of land under plantations (60.10 per cent of the total land under plantation) (Figure 3).

In other words 99.17 per cent of the land-owners possess an average of 1.64 has. of arable land and 0.25 has. of land under perennial plantations. On the other hand 0.83 per cent of the land-owners possess an average of 104.2 has. of arable land each and 10 has. of land under plantations.

The land ownership distribution of Peru can still be stated in another and perhaps more realistic way. According to the data of the Census (17), 36.11 per cent of the Peruvian land-owners have less than one hectare of land. (In this estimate the natural pastures and unproductive land, the land under forest and mountains as well as the cultivated land, is included) (all the items of Figure 1), 58.01 per cent (almost one half a million farmers) have less than two hectares, 70.36 per cent have less than 3

0.83% OF OWNERS OWN

99.17% OF

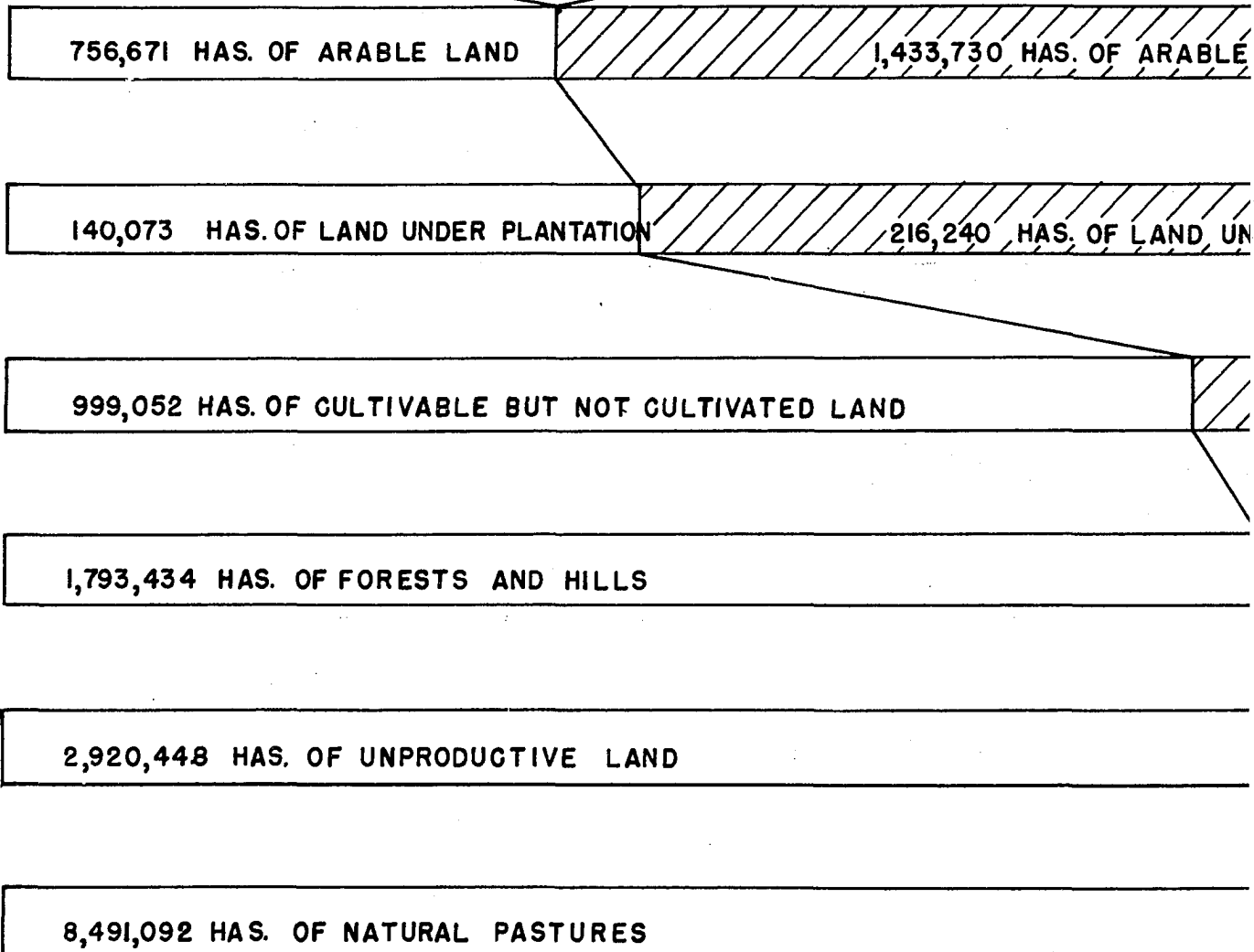


FIGURE 3. OWNERSHIP DISTRIBUTION OF THE AGRICULTURAL LAND
EACH LINE REPRESENTS 100 PER CENT OF THE CORRESPONDING

99.17 % OF OWNERS OWN

1,433,730 HAS. OF ARABLE LAND

216,240 HAS. OF LAND UNDER PLANTATION

IVATED LAND

337,117 HAS.

491,320 HAS.

365,139 HAS.

660,184

UTION OF THE AGRICULTURAL LAND IN PERU

R CENT OF THE CORRESPONDING TYPE OF LAND

hectares and 83.65 per cent have less than 5 hectares.

Apart from the land-owners there are about three quarters of a million farm workers who own no land and most of them have no other means than farm work from which to earn a living.¹

It is clear, therefore, that latifundia or the concentration of land in the hands of a few is neither the only nor the main problem of the Peruvian agrarian structure. Munifundia or the constant division and subdivision of the land into smaller plots is also a most grievous problem.

If the Agrarian Reform would distribute evenly all the land actually cultivated among all the land owners, each would have less than 3 has.² Furthermore, if all the landless rural workers were to receive a share of the actual cultivated land, all landless and land owners would receive less than 1.5 has. each.³

Further, 46.2 per cent of the rural population in the Peruvian highlands, where the main concentration and the greatest number of rural people exist, are under 16 years of age. In a few years this young population will be looking for jobs and a large part of them will seek opportunities

¹The Production Year Book 1964 (9) (Census VII, 1961) gives a figure of 1,556,000 active population in agriculture in Peru. The number of land-owners according to the Census is 878,666. On the basis of these figures the number of landless agricultural workers would be 677,334.

²Here the cultivable but not cultivated land is not included. If it were, the average per land owner would be 4.5 has.

³Here again, the cultivable but not cultivated land is not included. If it were, the average for agricultural active population would be 2.26 has.

in farming.¹

The preceding considerations were made in order to stress two important points: 1) that land reform conceived as a mere land redistribution is not the answer to the pressing problems of Peru, and 2) that general economic development of the nation with the consequent creation of new job opportunities is an essential part of the relevant solution of the problem. The practical consequence of these two points is that agrarian reform if it is to help Peru, has to be conceived primarily as an instrument for economic development. This consequence will be further elaborated in the main body of the present study.

D. Peru's Approach to Ameliorate These Defects

Some efforts have been made by the Peruvian Government, especially in recent times, to colonize or open up land in the high jungle (right bank of Apurimac River, Central region of the Huallaga River, "Huallaga central") and to implement irrigation projects in the Coast (i.e. San Lorenzo in the north, La Joya in the south). International technical and financial agencies, especially the World Bank and the Interamerican Bank of Development, BID, have helped in the planning and implementation of these projects.

Private settlers have moved into the jungle land, some of them, many years ago, like the Austrian and German immigrants who arrived in Peru more than a hundred years ago and settled in the Pozuzo area which even today

¹The 46.2 per cent was found in a Census of 30 Communities in the Pasco Department including 30,527 inhabitants which represent the 69.44 per cent of the total Communal population in Pasco. The Census was taken by personnel of the Central Sierra Agrarian Reform Project in 1964 with the author's assistance (24). The National Demographical Census gives the figure of 43.33 per cent of the total population of Peru under 15 years of age (37).

has only a mule track leading into the area. Other Germans settled more recently in the Oxapampa area and other immigrants and natives in different areas of the Ceja de Montana (high jungle). Due to lack of capital and infrastructure, such as communication and transportation facilities and organized markets, schools and health centers, many of the settlers have not prospered to any degree. There are a few settlers, however, who are located in privileged areas with access to markets and with good natural resources and these have been able to build up substantial fortunes.

In general, the government has not effectively encouraged successful colonization in the past. Oftentimes, the acquisition of land rights in the jungle was done only for speculative purposes by people who had no intention whatsoever to work the land by themselves but only wanted it for resale when land prices would advance.

In recent times large numbers of the Indians from different parts of the Sierra have moved, rather promiscuously, into the high jungle creating legal problems of land ownership, encouraging speculation of land prices, destroying the natural qualities of the soil through inappropriate cultivation methods and planting crops such as coffee, for which there will be limited markets in the near future.

A government agency, called "Tierras de Montana", was in charge of transferring legal land titles of jungle land to the applicants. Generally, this agency acted inefficiently and much too slowly. This agency has now ceased to function in the agrarian reform zones and has been absorbed by the agrarian reform agency in the area.

The Agrarian Reform Law passed in May, 1964, has provisions for land

redistribution (Title I, II, and IV), for technical aid to farmers (Title IX), for colonization of new lands (Title III), for land consolidation (Title VII) and for organization of cooperatives (Title X).

Under the Law (Title XII) a restructuring of the different governmental agencies which dealt with agrarian problems prior to the Law of 1964, has taken place. The former IRAG (Instituto de Reforma Agraria y Colonizacion) is now called ONRA (Oficina Nacional de Reforma Agraria). The SIPA organization (Servicio de Investigacion y Promocion Agraria), a research and extension agency, remains unchanged but is subject as is ONRA, to a higher organization, IRPA (Instituto de Reforma y Promocion Agraria) which coordinates its efforts. This higher organization is governed by the "Consejo Tecnico de Reforma y Promocion Agraria" in the implementation of the Agrarian Reform Law. (See Appendix.)

E. Need for an Analytical Model to Appraise Agrarian Structures from an Economic Point of View and for a Planning Model for Agrarian Reform Implementation

Most agrarian reforms have been planned and carried out without much help from economists. The reason for this fact seems to be as follows:

a) the main preoccupation of the agrarian reform promoters is political and social rather than economic and b) economists, when available, cannot give much advice and guidance due to the existing gap in economic theory in the area of the economic implications of structural change.¹

¹Economic theory has been generally kept under the limitation that Hicks put on his "Value and Capital" namely without any inclusion of reference to institutional controls (14, p. 7).

It is not surprising therefore, that most agrarian reforms are not having much success, at least from the economic point of view.

A remedy for this situation is to build up this neglected part of economic theory. As a departure point an analytical model could be constructed. This analytical model could consist of two parts: The first one would provide the ways and means to investigate the possible contribution of the agricultural sector to the general economic development in a given situation. The second part would try to give the guidelines for the construction of new agrarian structures capable of making the contribution of the agrarian sector to the general economic development a success.

To foresee the likely effects of one structure or another on the economic development of the country is not the only problem in agrarian reform implementation. There is inherently the basic problem of planning for the best use of scarce resources, especially personnel, money and time in the implementation of agrarian reform. There exists already planning models like CPM (Critical Path Model) and PERT (Program Evaluation and Review Technique) which it seems can be usefully adapted and applied to agrarian reform planning. The adapted method itself and the practical application of it to an agrarian reform program will be presented later in the study.

F. The Problem and Area Delimited for This Study

The present study will concentrate on the specific agrarian reform problems involved in the transfer of large livestock farms to the farm workers and to the neighboring Indian communities. This transfer is the

first land reform experience in Peru under the new Agrarian Reform Law. New structures are being tried out for the first time and problems in the implementation of the agrarian reform law and regulations appear also for the first time. Here an action planning model on the Critical Path vein has its first testing ground in an agrarian reform. The area, in the Central highland of Peru, will be described in the next chapter.

G. Objectives of the Study

The general objective of the study is to analyze the conditions under which the agrarian reform in the Central Sierra of Peru can be instrumental to economic development. Because agrarian reform implies structural change, the economic effects of such structural change are primarily sought in the study.

Three specific objectives of the study are: 1) to develop a model which could help in the selection and construction of the new structures in light of their efficiency in the attainment of economic development, 2) to apply an action planning model in terms of Critical Path and PERT methods to the agrarian reform process, and 3) to offer some alternatives for the solution of the problems that the present application of the agrarian reform law encounters in the vital aspects of land expropriation and land valuation.

H. Procedure Followed

Once the area under study (the Central Sierra of Peru) and its problems are identified, a set of hypotheses to be tested in the study are presented.

The testing of the hypotheses is preceeded by the construction and presentation of the two models, the efficiency model and the action implementation model.

The testing of the hypotheses will be done in the main part of the study in the context of the 1964 Agrarian Reform Law and its application in the Central Sierra of Peru.

I. Organization of This Report

First, the agrarian problems of the Central Sierra of Peru are presented within the physical, economic and demographic characteristics of the region (Chapter II).

Then the study proceeds to identify and explain the defects within present agrarian structures obstructing development (Chapter II).

Several hypotheses are formulated about the delimiting, diagnosis and remedial stages, and from that point on the main effort of the study concentrates in the remedial stage (Chapter II).

An efficiency model for testing structures which are considered remedial to the present situation and helpful to the general economic development of the country is presented (Chapter III).

An action planning and implementing model is also presented, which is considered vital for the successful agrarian reform implementation process (Chapter IV).

The 1964 Agrarian Reform Law and its application in the Central Sierra is analyzed in the light of the facts and with the help of the efficiency

and planning models (Chapter V).

Finally, the results of the inquiry and the recommendations are presented (Chapter VI).

II. AGRARIAN PROBLEMS WITHIN THE CENTRAL SIERRA OF PERU

This chapter of the study has three parts: The first part A) deals with the physical, economical and population conditions of the area delimited by the present study, namely the Central Sierra of Peru. This first part sets the background for the study.

The second part B) is a search for defects in agricultural structures which obstruct development. This part intends to be a general guideline for the other parts of the study in their search for solutions.

The third part C) formulates hypotheses that are thought to be relevant (1) to the present unsatisfactory situation found in the first and second parts and (2) to the possible solutions. These hypotheses guide the effort throughout the following chapters.

A. Characteristics of the Central Sierra

1. Physical conditions

The territory with which the present study is concerned is located in the heart of the Peruvian Andes, east of Lima, covering large parts of the Departments of Pasco and Junin and small parts of the neighboring Departments of Huancavelica, Lima and Huanuco (Figures 4 and 5).

The area begins on the Central highway 135 Km. from Lima going eastward towards the Selva (Jungle) on the east side of the Andes. At this point the zone extends northwest and southeast for a total length of about 385 Km. and with an average width of about 110 Kms. and with a total area of 27,876 Km² (Figure 5).

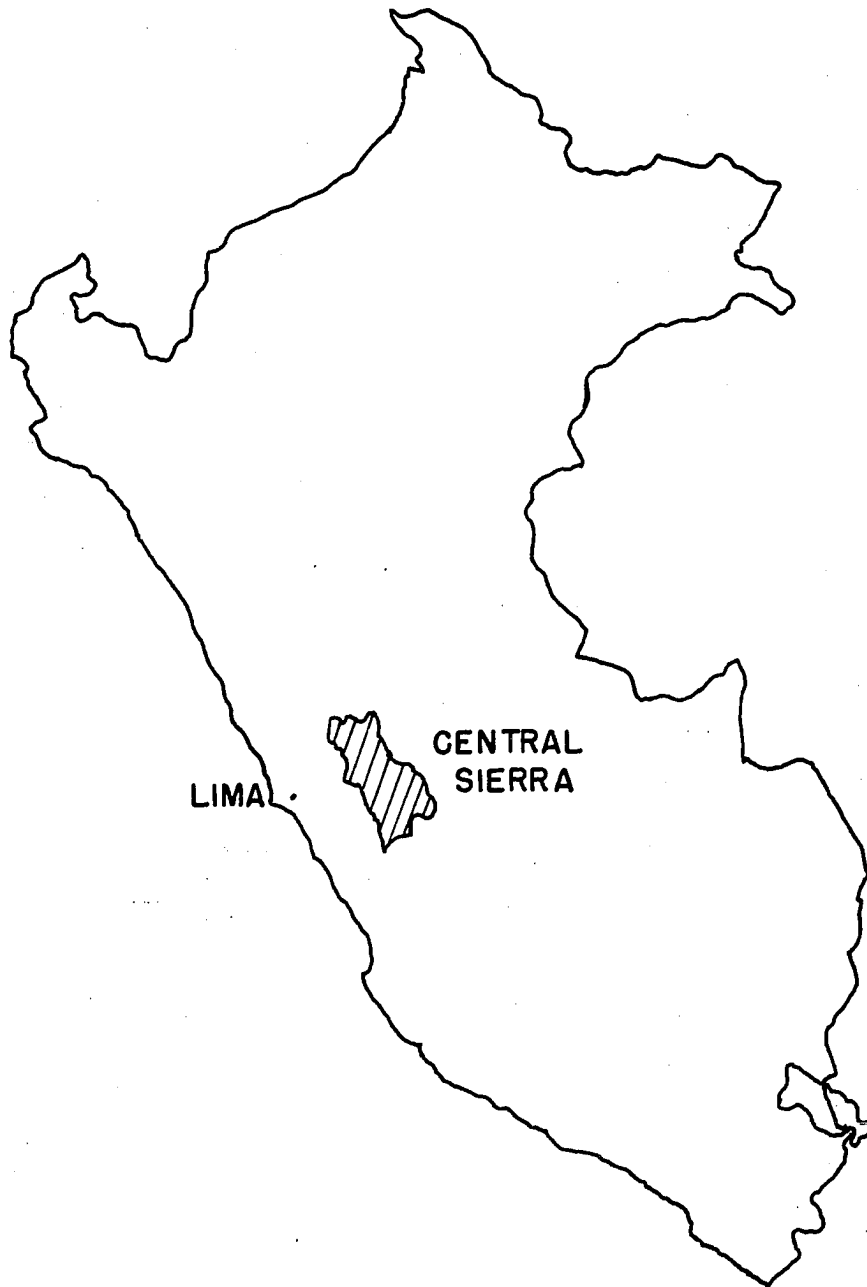


FIGURE 4. LOCATION OF THE CENTRAL SIERRA WITHIN PERU

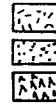
Figure 5. Area of the Central Sierra Agrarian Reform Project.
Source: ONRA Programa Sierra Central, Departamento de Ingenieria,
Tarma, Peru, Nov. 1965.

PERU

ZONA DE REFORMA AGRARIA DE LA SIERRA CENTRAL

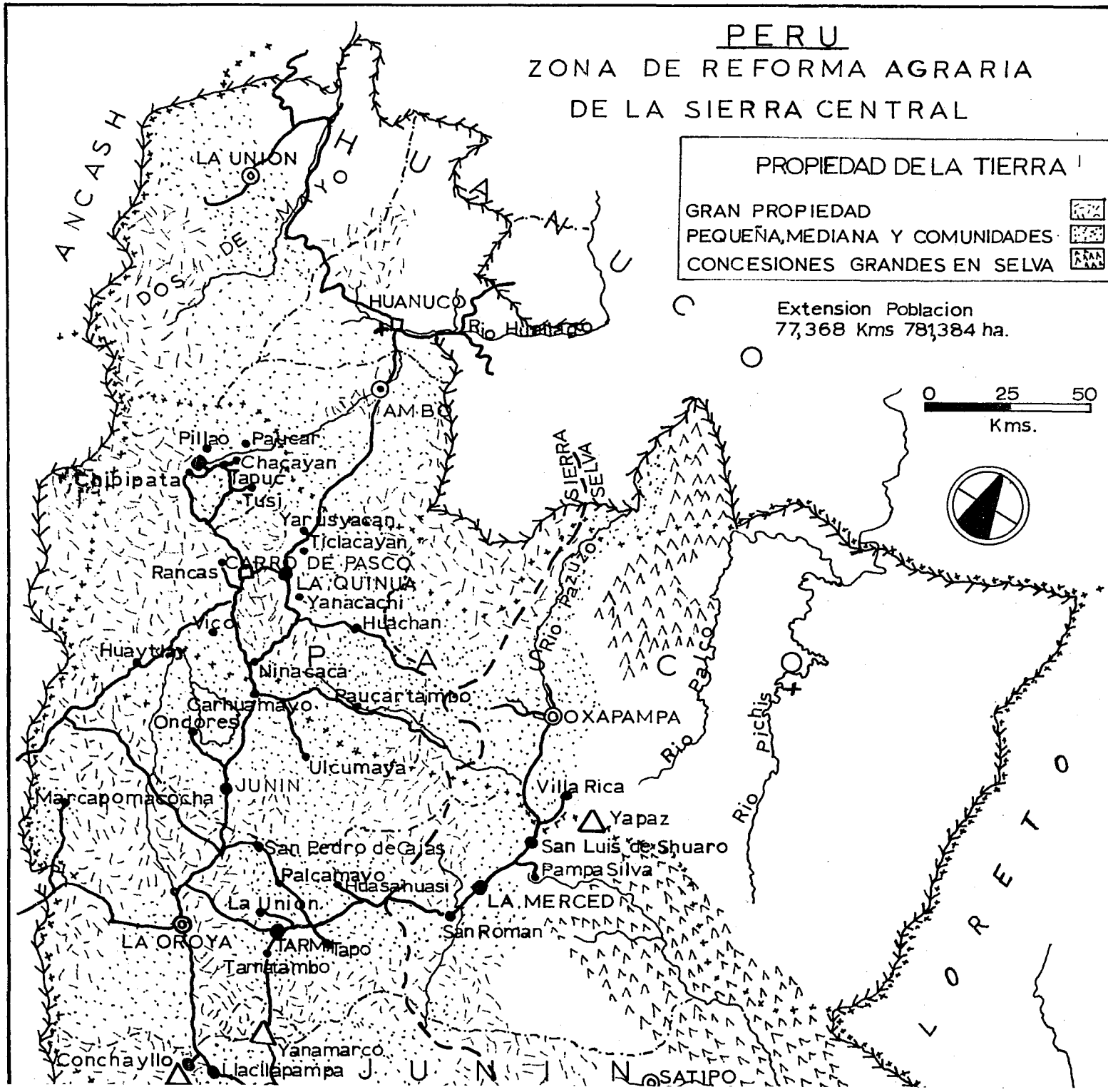
PROPIEDAD DE LA TIERRA

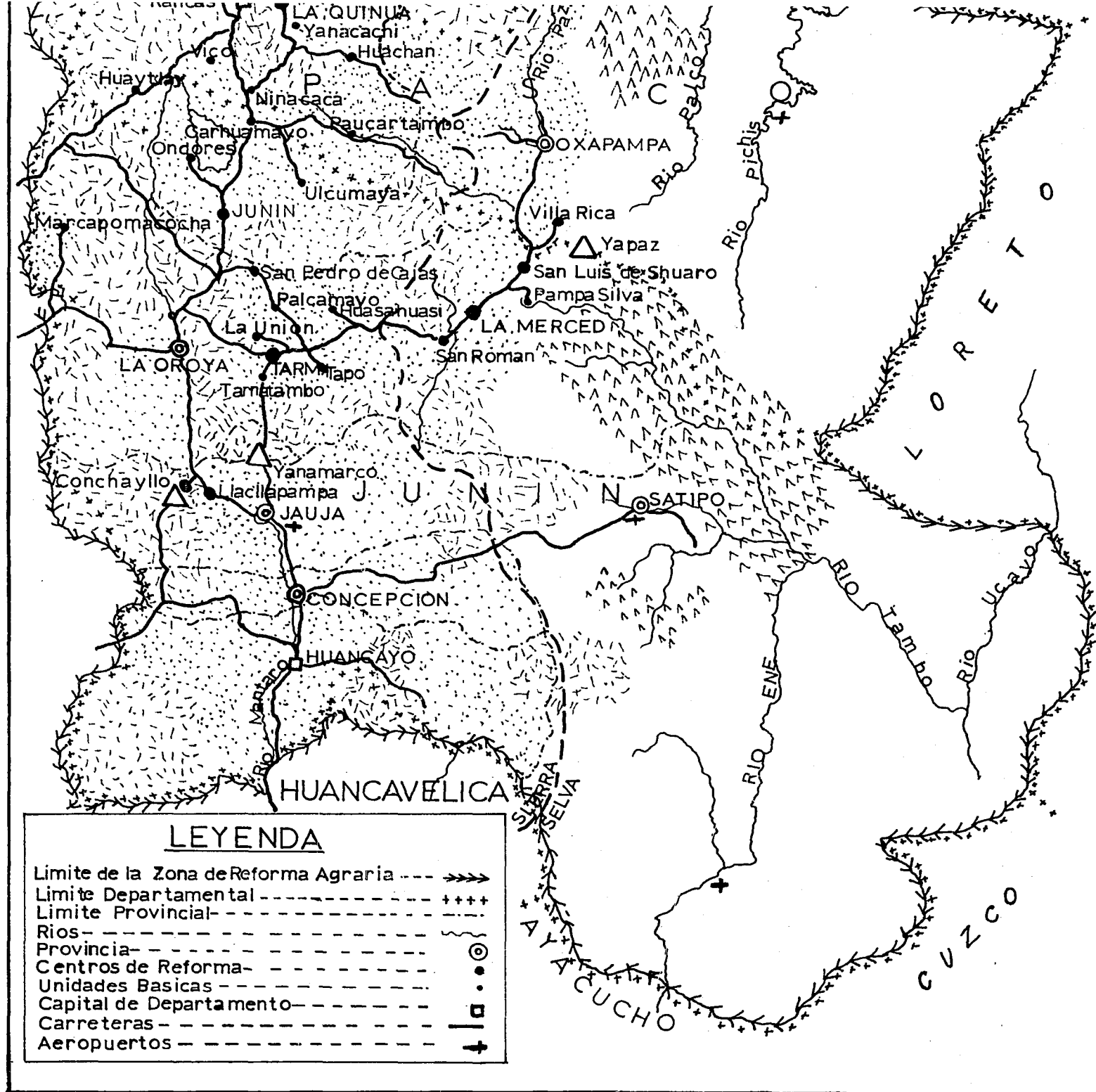
GRAN PROPIEDAD
PEQUEÑA, MEDIANA Y COMUNIDADES
CONCESIONES GRANDES EN SELVA



Extension Poblacion
77,368 Kms 781,384 ha.

0 25 50
Kms.





Two relatively large parts of this area are flat (Altiplano or highlands) including one part in the center around the Junin Lake and another part in the south including the Mantaro valley which extends from the town of Jauja into the south of Huancayo city.

The entire area is at high altitude above sea level. Some deep inter-andean valleys go somewhat below 3,000 metres; other areas are located at near 5,000 m. Many mountain peaks of the western fringes of the area are at altitudes above 5,000 m.; some reach 5,800 m.

The main part of the area between 3,800 to 4,700 m. altitude is covered with pastures of poor quality due to the severe conditions of the altitude in which it is located and the latitude (between 10 and 12 degrees South). Crop land is found at lower levels especially in valleys and in protected areas.

According to the studies of Joseph A. Tosi (35) the temperatures of the Central Sierra are below 0 degrees Centigrade during the entire year at altitudes above 5,000 m. At altitudes between 4,000 to 5,000 m. (Puna and Paramo) the average temperature varies between 0°C. in winter and 6°C. in summer. In the humid valleys between 3,200 to 4,200 m., the average temperature varies between 6°C. in winter and 12°C. in summer. In the sub-humid and semi-arid valleys between 2,100 to 3,350 m. the average temperature is 12°C. during winter and 18°C. at summer.

The significant rainfall occurs during the period from mid-September to the end of April. January, February and March are the months of more frequent rains. The annual rainfall varies between 500 to 1,000 mm. (19.68 to 39.37 in.).

2. Economic conditions

The main economic activities in the zone under study are tourism, mining, transportation, trade, livestock (especially sheep) and crops.

Tourism is almost totally centered in Huancayo city, famous for the Sunday Indian fair, where many Indian handicrafts are for sale. A small part of the tourist stream goes also to Tarma, particularly on some special days, like Holy Week and Easter and the 28th of July, a national holiday.

Mining is carried on mainly by Cerro de Pasco Corporation that employs 14,500 people (including 1,905 employees, 12,169 miners and metal workers and 426 staff personnel). Besides the mining activities, Cerro de Pasco Corporation has a melting plant and refinery in the town of La Oroya.

The main mineral mined and treated by Cerro de Pasco Corporation is copper (490,812 short tons of mineral with 81,379,204 lbs. of refined copper), followed by lead (228,112 short tons of mineral 178,034,377 lbs. of refined lead), zinc (163,187 short tons and 118,212 lbs. of refined zinc), silver (19,696,187 oz.) and gold (39,457 oz.). Other minerals produced in smaller quantities are bismuth, cadmium, selenium, and tellurium.¹

Transportation is partly based on mining activities. Cerro de Pasco Railway connects La Oroya with the town of Cerro de Pasco and the mining center of Goyllarisquizca in the north of the area, and Pachacayo with the mining district of Jatunhuasi (coal mines) and the nearby Yauricocha

¹Data from Cerro de Pasco Corporation information service, all referred to the year 1963.

(mineral mines) in the south. The railway is owned and operated by the Cerro de Pasco Company. The line serves part of the mining transportation needs but has also general cargo and passenger services between La Oroya and Cerro de Pasco city.

The other railroad line in the area is the Ferrocarril Central del Peru, connecting Lima with La Oroya and Huancayo city.

Highway transportation is constantly increasing with the improvement of the roads. The main roads are the Central Highway which connects Lima with La Oroya. From La Oroya, the Central Highway is divided into two branches, one goes southeast to Hancayo, the other subdivides further, the longest subbranch goes northwest to Cerro de Pasco, and from Cerro de Pasco east to Huanuco and Pucallpa (Jungle town by the Ucayali river, about 100 Km. toward the Brazilian border and at 70 m. above sea level). The shorter subbranch which goes to Tarma, 3,100 m. above sea level, and down to Chanchamayo, 800 m. at San Ramon in the High Jungle. This is the shortest communication road between the Jungle and Lima. The Central Highway reaches its highest point at the Ticlio pass 4,843 m. (15,889.88 ft.) above sea level at Km. 135 from Lima.

These roads need constant repair work because of basic building failures together with the severe climatic conditions. Some parts of the road need substantial improvements and other parts require complete reconstruction. Road maintainance, repair and improvement occupies at present a small part of the area labor force, but could occupy a substantial part of it if the badly needed works were undertaken.

An increasing number of private cars, passenger buses, and trucks transporting minerals, fuel, vegetables (from Tarma and Mantara valley) wood and tropical fruits (from the nearby jungle), use the roads. The main stream of transporting units go to and from Lima which, with its two million inhabitants, is by far the largest market of Peru.

There is an active trade, both locally and, from a relative point of view of Peru also, interregionally. There are town fairs once or twice a week in all major towns of the area. In these towns, there are also shopping centers servicing the town population and the neighboring villages. Most important for the development of the area is the trade with the departments capital cities, Lima and with the nearby jungle.

Objects of trade are agricultural and livestock products, wool, and other fibers, textiles, handicrafts and manufactured products, fuel, wood and tropical fruits.

Industrial activity: Aside from the Cerro de Pasco Corporation melting plant and refinery at La Oroya and the Cemento Andino Plant near Tarma there are no other large industrial operations in the area. There is construction activity in the larger towns and growing truck and motorcar repair shops and fuel (gasoline) distribution stations.

Services are performed in large part by civil servants (including teachers) as well as by employees of bank agencies, doctors, and nurses. The numbers and percentages of people employed in different activities are presented later under the heading of population conditions.

Livestock production: The main livestock operation is sheep raising,

followed by cattle and horse raising. The wool produced by the large farms (haciendas) is sold in large part to international markets. The wool production of the small farms (individuals grouped in Indian "Comunidades") or farm workers on the haciendas, is partly sold to Lima or local dealers for marketing, and partly used for home consumption (rudimentary textile and handicraft industry, and home use for the family clothing needs). Meat is sold mostly to the local people and also to Lima.

Crop production: The main crop production consists of potatoes and other tubers (oca, olluco) and truck farming concentrated almost entirely in the Tarma and Huancayo valleys. Agricultural crop production serves the local needs and supplies the Lima market. The supply of vegetables from the area to the Lima Central market is important as the following annual percentages of some of the products clearly show (27):¹

93.90 per cent of the carrots arriving at the Lima central market come from the Central Sierra area, 71.53 per cent or 6,835 M.T. from Tarma and 22.37 per cent or 2,137 M.T. from Huancayo.

92.22 per cent of the lettuce supply to the Lima central market comes from Tarma (1,766 M.T.).

67.98 per cent of the edible corn (choclo) supplied to the Lima central market comes from two areas of the Central Sierra, namely Hancayo with 890 M.T. and Tarma with 747 M.T.

The supply of potatoes from the Central Sierra to the Lima central market amounts to 36.82 per cent of the total. The three main areas in the Central Sierra supplying potatoes to Lima are Huancayo with a total of

¹Data for other important products from the area like celery, spinach, beans, etc. is not available.

18,904 M.T., Jauja with 11,009 M.T. and Junin with 2,673 M.T.¹

3. Population conditions

The 1961 National Demographic Census (18, p. 5, 6) gives population data by Departments which do not coincide exactly with the area under study. The total population of Pasco according to the Census is 138,369 inhabitants including 114,821 in the Sierra area and 23,548 in the Selva. For Junin, the Census gives a total of 521,210 inhabitants with more than 400,000 people living in the Sierra. The total population of the two Departments represents 6.7 per cent of the total population of Peru.

The total Sierra population of the two Departments is therefore about 538,369. Because the area under study extends beyond the two Departments, its total population is somewhat greater. However, there is no available data to determine exactly how much greater it is but it does not seem to go much beyond 600,000.

The active population² in each Department according to the National

¹Data refer only to white potatoes.

²The National Planning Institute (Instituto Nacional de Planificacion, INP (18, p. 306) defines active workers including the following groups: 1) Employed (**ocupado**) a person who at date of Census was working at the service of an employer or for himself and received remuneration in kind or money. 2) Unemployed (**desocupado**) a person who at the date of the Census was not working because of having lost his job that he had and was looking for a paying job. 3) Aspirant to work (**aspirante a trabajar**) a person who at the date of the Census, was looking for work for the first time, that is to say that until that time, he had never been employed. 4) Non-remunerated family worker (**trabajador familiar no remunerado**) a person who at the date of the Census was working without remuneration in a firm or business that was operated by a member of his family and who worked at this job for at least one-third of the normal day's work.

Census is 41,086 persons for Pasco, approximately 29.7 per cent of the total population of the Department (17, p. 226), and 159,245 persons for Junin, approximately 30.4 per cent of the total population of the Junin Department (17, p. 224).

The census of the rural population undertaken by the "Instituto de Reforma Agraria, Proyecto Sierra Central" in 1964 (24)¹, which in the future will be referred to as Regional Census, gave for the two areas studied in Pasco Department (namely Yanahuanca and La Quinua) 29.14 per cent and 27.02 per cent of the total population actively employed. These figures are lower than the National Census percentage (29.7 per cent) but do not differ significantly considering that the Regional Census is concentrated in the rural area and includes only 34.26 per cent of the rural population of the Pasco Department.²

Of the Pasco active population, 48.10 per cent is engaged in Agriculture according to the National Census (17, p. 230). The Regional Census gave an average figure for the two areas studied of 45.47 per cent.

The National Census gives a figure of 53 per cent of the Junin population engaged in agricultural and livestock occupations (17, p. 230). The Regional Census in the Junin Department is too fragmentary and not yet sufficiently digested to enable us to make comparisons as it was done for Pasco.

¹Unpublished data. The discussion of the reliability of these data is left for Chapter V.

²Rural population according to the National Census, is 89,355 (17, p. 226-227). Rural population included in the Regional Census is 30,527 covering 30 Indian Communities (75 per cent of total number of Communities in Pasco) and 69.44 per cent of total communal population of Pasco. Note also the different date of the two sources. The National Census was done in 1961 though the results have not appeared until 1965, the Regional Census has been conducted in 1964 and early 1965. An increase, therefore of the young population could explain the lower figures of the Regional Census.

The percentual distribution of the active population into four occupational classifications in the two areas of the Pasco Department studied by the Central Sierra Agrarian Reform Institute is given in Table 1. The advantage of the four classifications is to show the extent that the agricultural activity occupies the active population of the two areas. Table 2 gives the distribution of the active population between the different economic activities in a more comprehensive way and for the entire Departments of Pasco and Junin.

Table 1. Distribution of the active population in two areas of Pasco Department^a

Active population in:	Zone 1	Zone 2
	La Quinoa	Yanahuanca
	Per cent	Per cent
a) Agricultural and livestock occupation only	37.74	63.2
b) Agricultural and livestock occupation as principal, but with a secondary occupation elsewhere	11.22	14.0
c) Non agricultural or livestock occupation as principal but with a secondary occupation in agriculture or livestock	20.36	12.2
d) Non agricultural or livestock occupation only	30.68	10.60
	100	100

^aResults of the regional census taken by Instituto de Reforma Agraria, Proyecto Sierra Central in two areas of Pasco Department, 1964. Unpublished data (24).

Table 2. Distribution of the active population between the different economic activities in the departments of Junin and Pasco^a

Active population in:	Junin		Pasco	
	Number	Per cent	Number	Per cent
Agriculture	84,057	53.00	19,807	48.10
Mining	10,687	6.66	9,597	23.20
Manufacturing	19,843	12.40	2,575	6.25
Construction	4,313	2.70	928	2.60
Electricity, gas, water and sanitation services	330	0.24	55	0.13
Trade	12,309	7.70	2,164	5.25
Transport	4,779	3.00	725	1.77
Services	17,791	11.20	3,715	9.00
Not specified	5,136	3.10	1,520	3.70
	159,245	100	41,086	100

^aData taken from the 1961 National Demographic Census (17, p. 230-231).

According to Table 2 it can be seen that a larger percentage of the active population of Pasco is engaged in mining and a lesser percentage in agriculture than Junin. Junin, in the Mantaro valley, and Tarma valley have an intensive type of agriculture lacking in Pasco; Junin has also a more acute minifundia problem than Pasco, especially in the Mantaro valley.

Manufacturing industry as well as services are more developed in Junin than in Pasco. Electricity, gas, water and sanitation services are lacking in both Departments. Trade and transport are of some importance in both Departments.

The National Census as well as the Regional Census show a high percentage of young population in the area. In the Regional Census it was found in 1964 that 46.20 per cent of the population is under 16 years of age, and 56 per cent is under 21 years of age (Figures 6 and 7). This seems to be confirmed by the low percentage of active population which is lower than in nations with an older population structure as in France which has a 42.4 per cent of her total population as active, and Sweden which has a 43.3 per cent of her population active, while the area of this study has only 29 to 30 per cent active according to the National Census, and 27 to 29 per cent active according to the Regional Census.

Infant mortality¹ is 13.5 per cent in Junin Department (year 1963) (28). For Peru the statistic is 9.48 per cent while for the same year it was 4.05 per cent for Spain, 2.52 per cent for USA, 2.34 per cent for France and 2.18 per cent for U.K. (37, pp. 140-141).

The illiteracy² of the population over 17 years of age in Pasco and Junin Departments according to the National Demographic Census can be seen in Table 3.

¹Infant death rate for 100 live births under one year of age.

²Illiteracy is taken in the strict sense of people unable to read or write.

Figure 6. Population structure in the year 1964 of 30 Comunidades in the Pasco Department.

AGE GROUP

M = 15,440

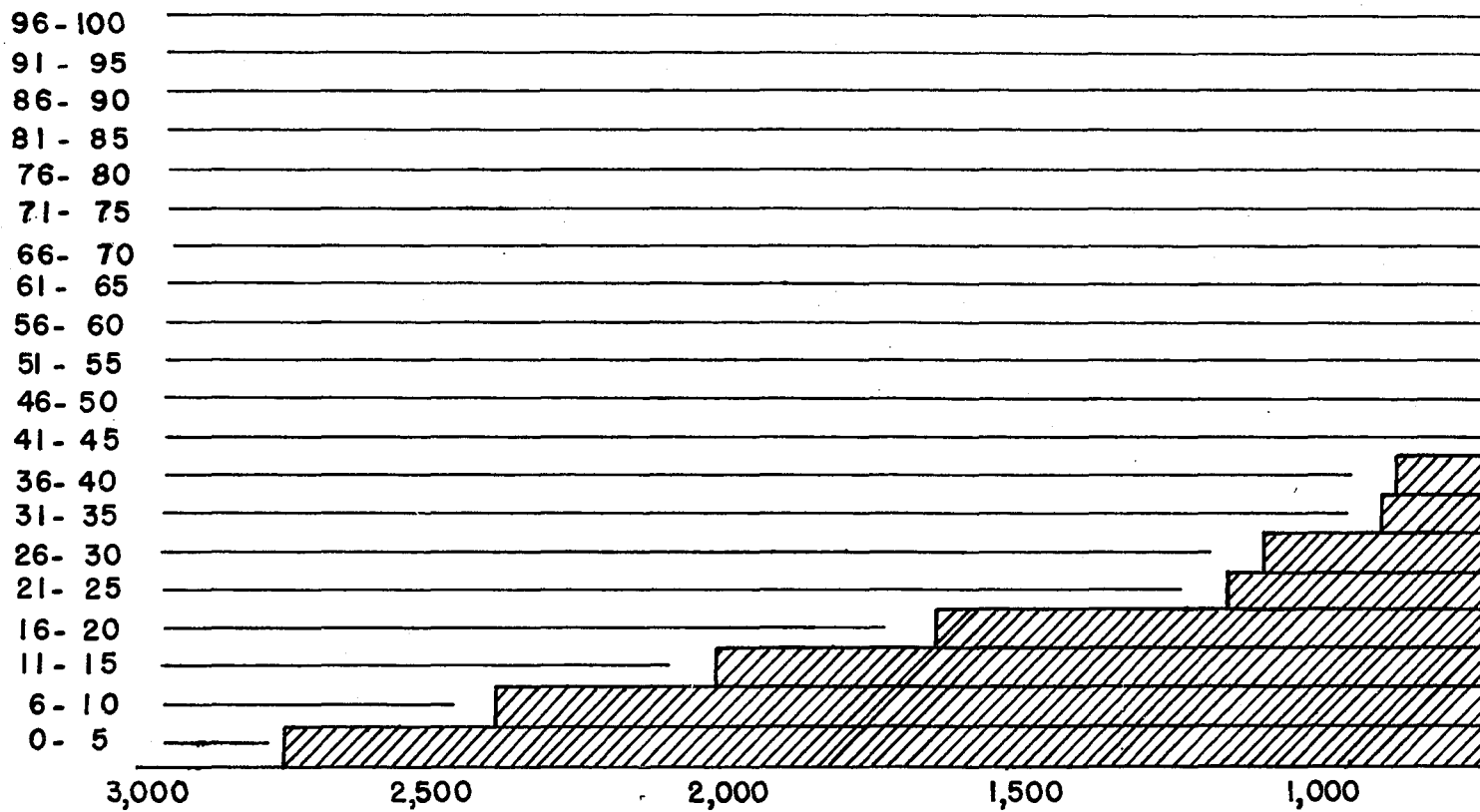
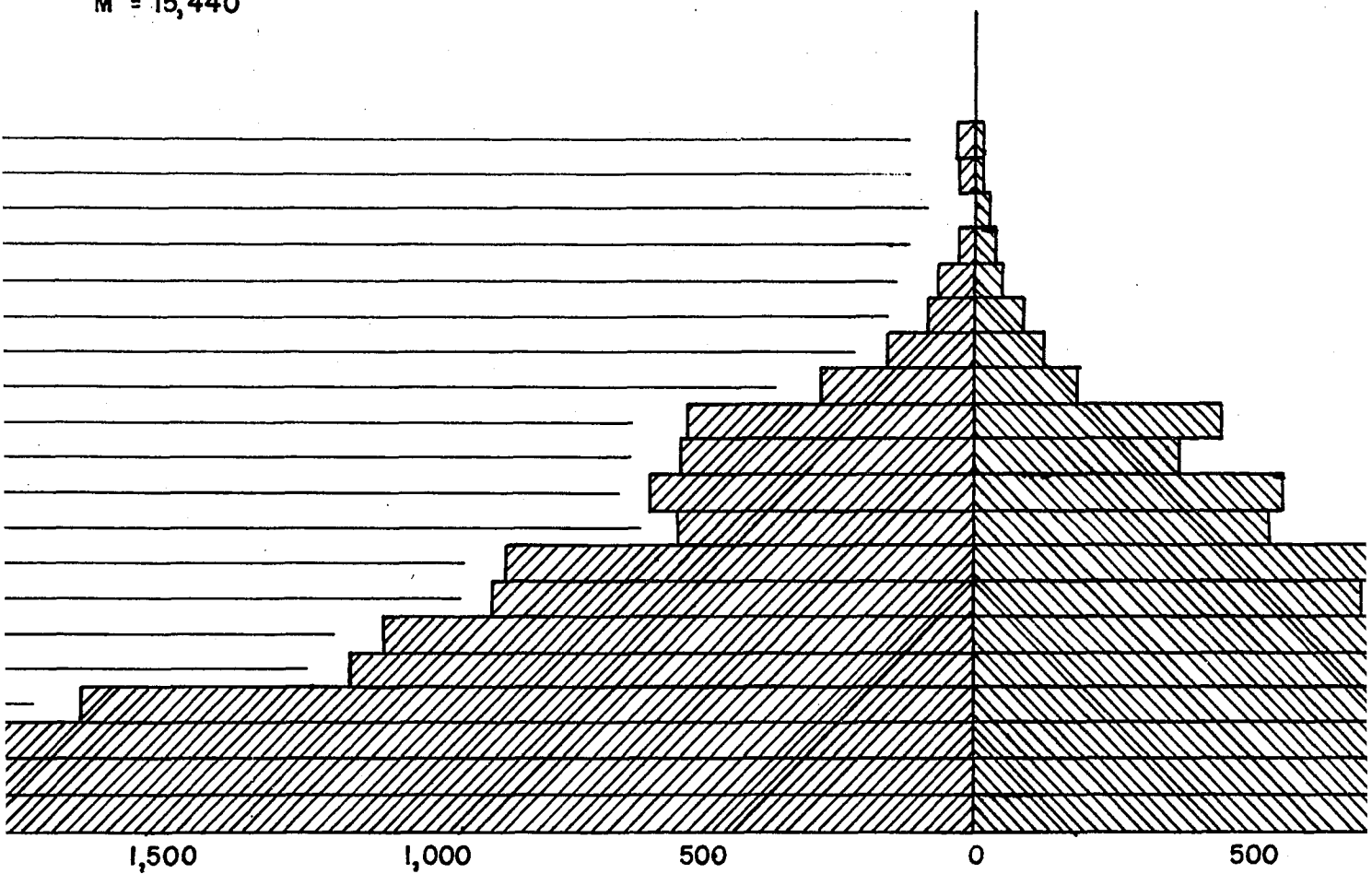


FIGURE 6. POPULATION STRUCTURE IN THE Y

IT INCLUDES 75 PER CENT OF THE TOTAL NUMBER OF C

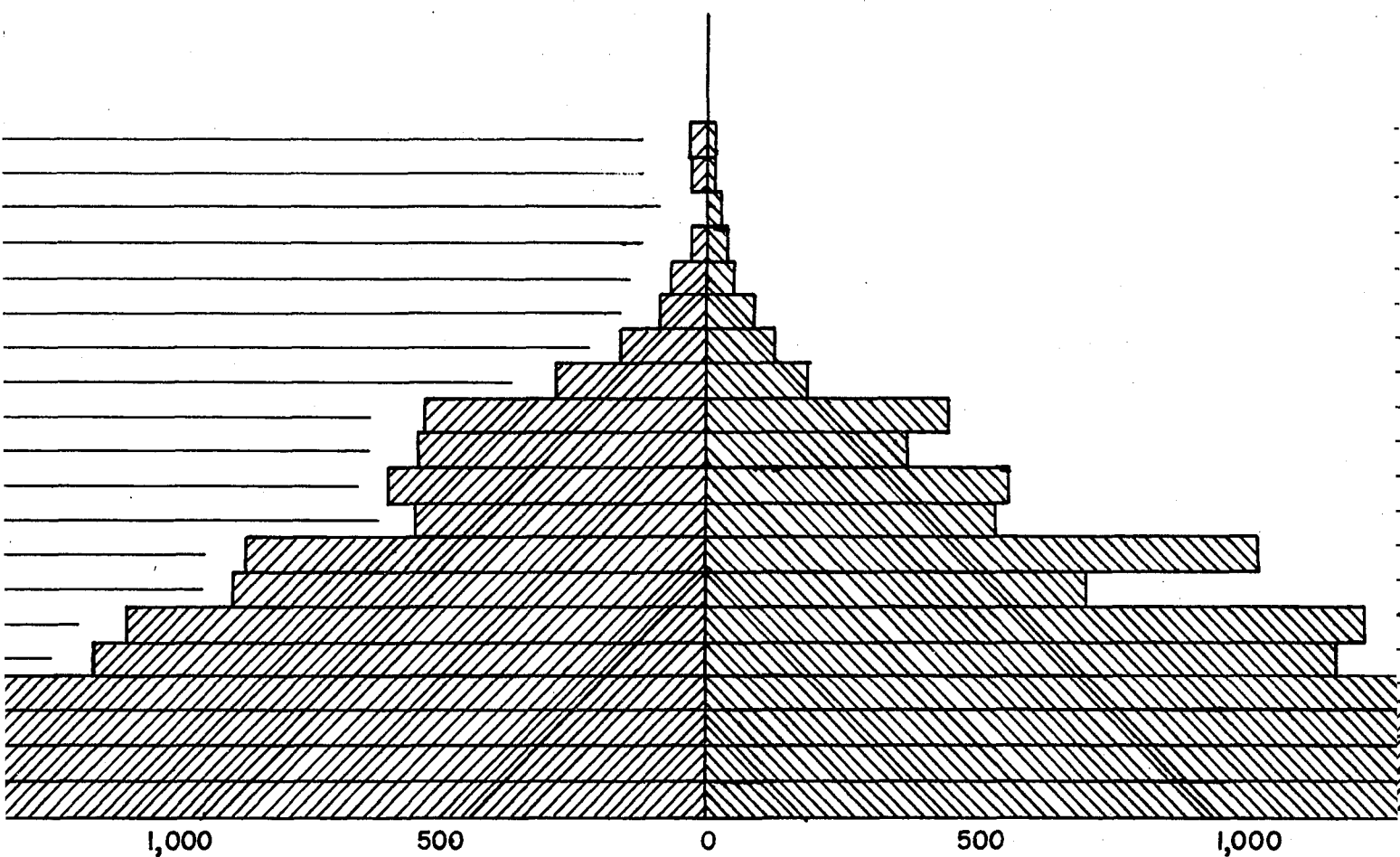
SOURCE: ONRA F

M = 15,440



PULATION STRUCTURE IN THE YEAR 1964 OF 30 COMUNIDADES IN THE PA
ER CENT OF THE TOTAL NUMBER OF COMUNIDADES IN PASCO AND 69.44 PER CENT OF THE

SOURCE: ONRA PROGRAMA SIERRA CENTRAL. DEPARTAMENTO DE

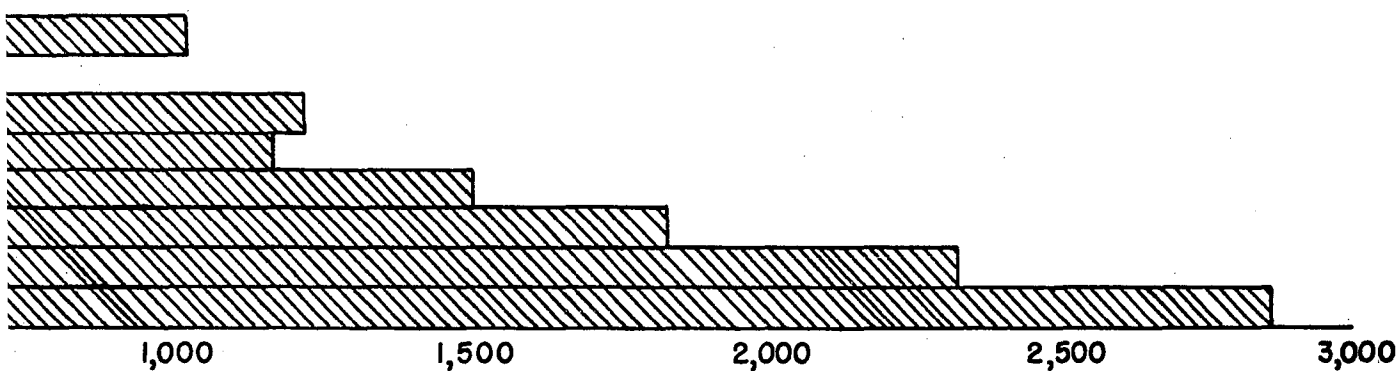


STRUCTURE IN THE YEAR 1964 OF 30 COMUNIDADES IN THE PASCO DEPARTMENT

TOTAL NUMBER OF COMUNIDADES IN PASCO AND 69.44 PER CENT OF THE TOTAL POPULATION

SOURCE: ONRA PROGRAMA SIERRA CENTRAL. DEPARTAMENTO DE ECONOMIA

F = 15,087



PASCO DEPARTMENT (30,527 INHABITANTS)

TOTAL POPULATION LIVING IN COMUNIDADES IN PASCO

ECONOMIA

Figure 7. Structure of the population up to 15 years of age in
30 Comunidades in the Pasco Department.

YEARS OF
AGE

M = 7,091

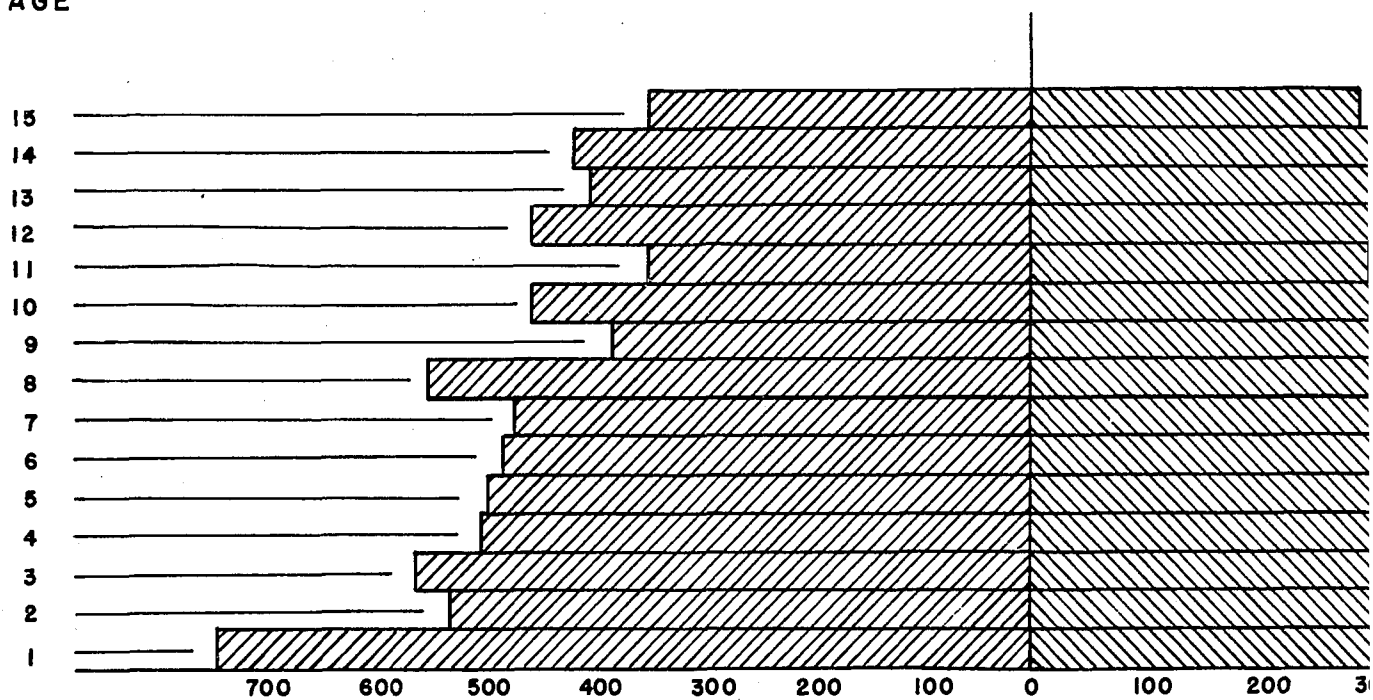
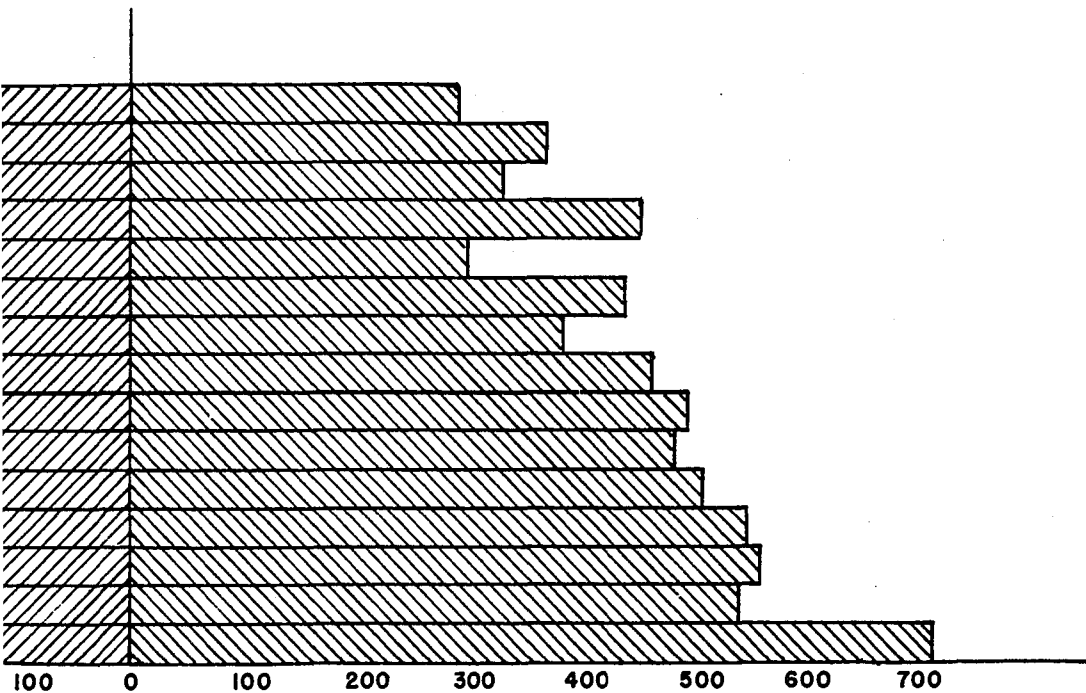


FIGURE 7. STRUCTURE OF THE POPULATION UP TO 15 YEARS OF AGE IN THE PASCO DEPARTMENT (14,111 INHABITANTS) IN THE YEAR 1991

SOURCE : ONRA

PROGRAMA SIERRA CENTRAL. DEPARTAMENTO PASCO

F = 7,020



IN UP TO 15 YEARS OF AGE IN 30 COMUNIDADES IN THE
HABITANTS) IN THE YEAR 1964

RRA CENTRAL. DEPARTAMENTO DE ECONOMIA

Table 3. Illiteracy of the population over 17 years of age in the departments of Pasco and Junin^a

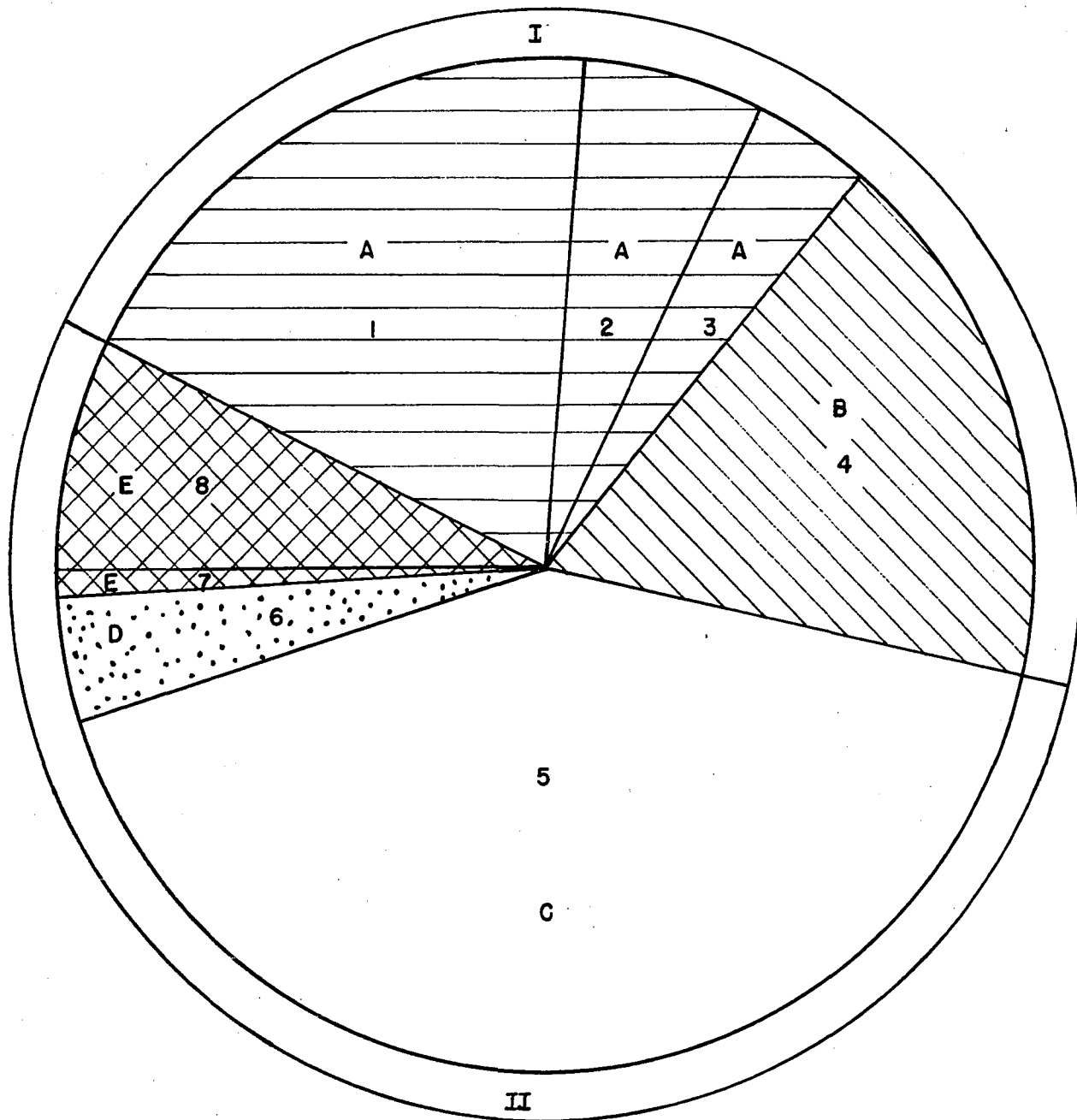
	Percent of total population	Percent of urban population	Percent of rural population
Pasco	48	39.5	53
Junin	38	27	49.5

^aData from the 1961 National Demographic Census (17, pp. 178-179; 202-203).

In the Regional Census it was found that a mean 43.65 per cent of the heads of families of the Yanahuanca area and 32.8 per cent of the La Quinua area were illiterate.

Figure 8 presents the land distribution in the Central Sierra. It shows the situation before the agrarian reform project started. The area of the Sierra is the one that concerns the study (in the graph the land of the jungle is also included). Of the 2,787,600 hectares (all land, agricultural and otherwise) 60.5 per cent is included in the "latifundios" (large states), owned by 33 landowners (individuals and corporations), while the remaining 39.5 per cent is owned by Comunidades and individuals with a calculated total of 62,300 farmers. If then, the landlords are considered as individuals (they are not, because most of them are corporations, though including few persons, often only the members of a rich family, like the Fernandini family who owned Algolan), the uneven distribution of land is spectacular. In relative numbers, 0.053 per cent of the landowners have

Figure 8. Land ownership distribution in the Central Sierra Agrarian Reform Area. Source: ONRA Programa Sierra Central, Departamento de Ingenieria, Tarma, Peru.



I. AREA

A. G

1.

2.

3.

B. C

4.

II. AREA

C. TE

5.

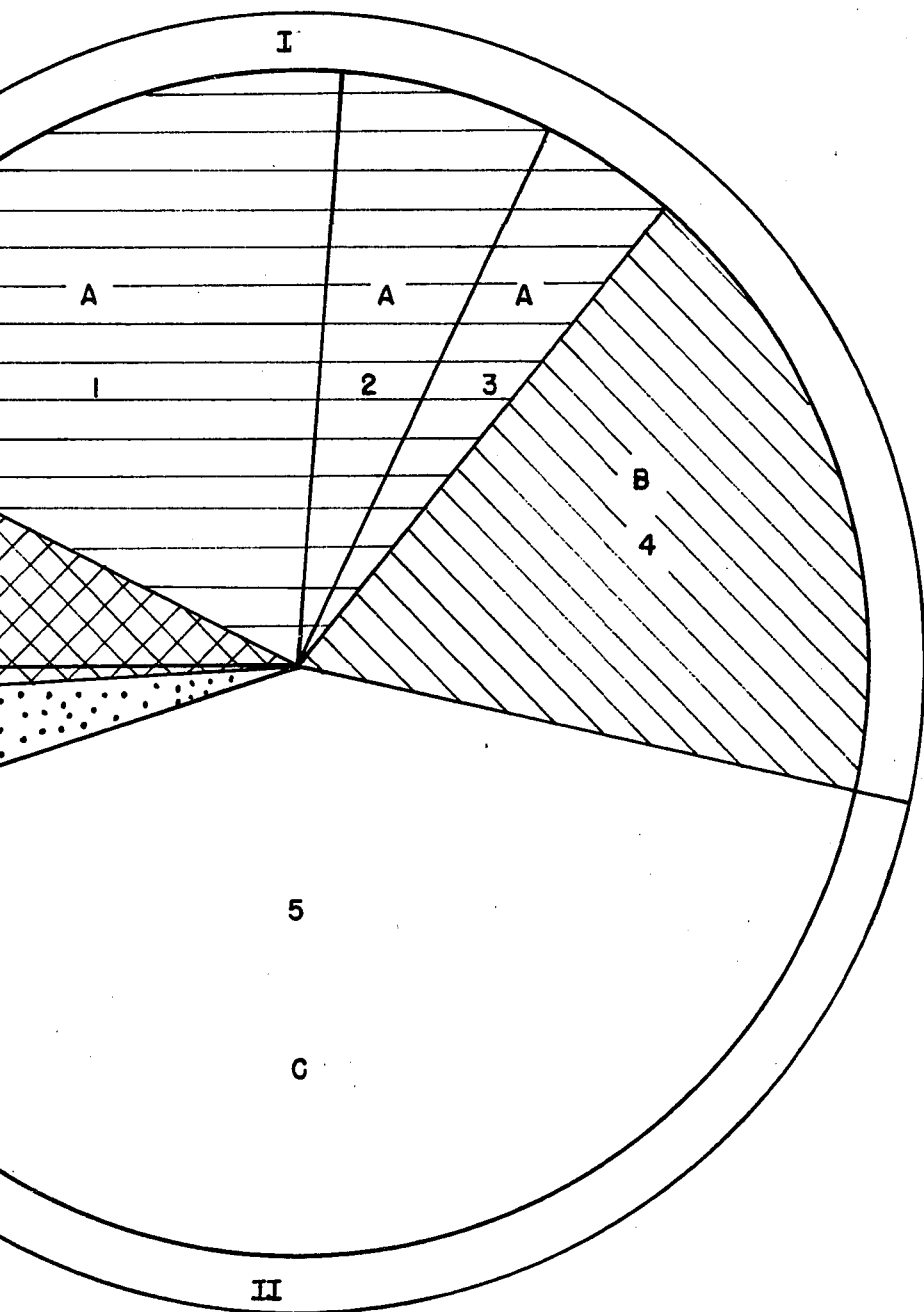
D. DE

6.

E. G

7.

8.



I. AREA OF SIERRA

A. GRANDES LATIFUNDIARIOS

1. 6 PROPIETARIOS
11,752 KM.2
2. 10 PROPIETARIOS
3,489 KM.2
3. 17 PROPIETARIOS
1,616 KM.2

B. COMUNIDADES Y PROPIETARIOS

4. 62,300 PROPIETARIOS

II. AREA OF SELVA

C. TERRENOS DEL

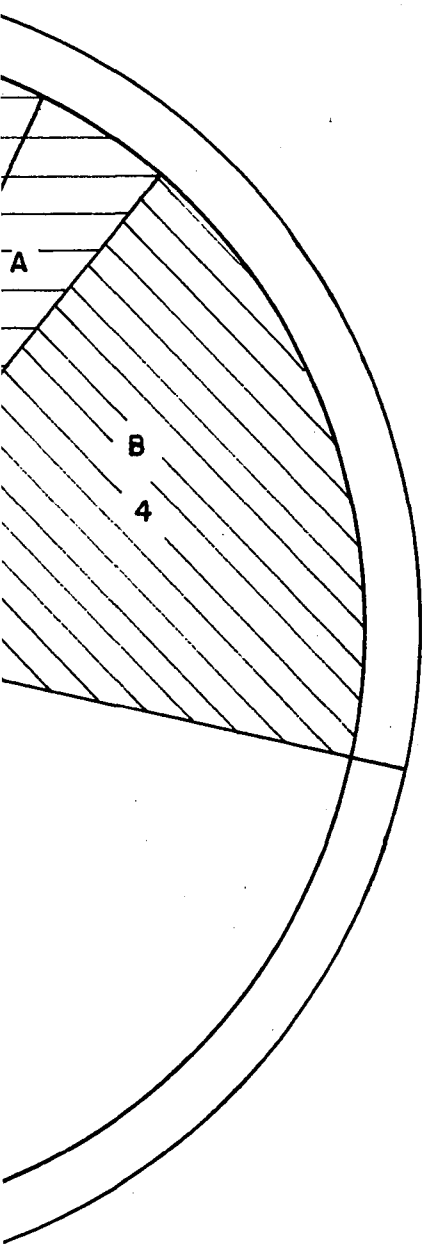
5. INCULTOS 29

D. DEN, MED Y P.P.

6. 3,500 PROPIETARIOS
3,055 KM.2

E. GRANDES CON

7. 55 PROPIETARIOS
681 KM.2
8. 4 PROPIETARIOS
5,610 KM.2



I. AREA OF SIERRA 27,876 KM2 (41.5 %)

A. GRANDES LATIFUNDIOS 16,857 KM.2 (60.5 %)

1. 6 PROPIETARIOS CON + 100,000 HA.
11,752 KM.2 (42.2 %)
2. 10 PROPIETARIOS CON + DE 20,000 HA.
3,489 KM.2 (12.5 %)
3. 17 PROPIETARIOS CON + DE 2,000 HA.
1,616 KM.2 (5.8 %)

B. COMUNIDADES Y MEDIANOS Y PEQUEÑOS PROPIETARIOS 11 019 KM. 2 (39.5%)

4. 62,300 PROPIETARIOS

II. AREA OF SELVA 39,194 KM.2 (58.5 %)

C. TERRENOS DEL ESTADO

5. INCULTOS 29,848 KM.2 (76.2 %)

D. DEN, MED Y P.P.

6. 3,500 PROPIETARIOS CON - DE 500 HA.
3,055 KM.2 (7.8 %)

E. GRANDES CONCESIONES 5,799 KM.2 (16.0 %)

7. 55 PROPIETARIOS CON DE 500 HA.
681 KM.2 (1.7 %)
8. 4 PROPIETARIOS CON DE 30,000 HA.
5,610 KM.2 (14.3 %)

60.5 per cent of the land, while 99.947 per cent landowners have only 39.5 per cent of the land.

B. Defects within Agrarian Structures Obstructing Development

Here a general statement of the defects which seem to obstruct development is presented. Defects will be divided into three groups: 1) defects found within large land holdings (Haciendas), 2) defects existing within Comunidades, and 3) other related defects of a more aggregative nature.

1. Defects within Haciendas

One cannot speak of a single type of hacienda in the Pasco-Junin area. Some large enterprises comprising several haciendas like "Cerro de Pasco Corporation" (16 Haciendas, 334,483 Has.) and "Algolan" (16 Haciendas, 309,092 Has.) and smaller operations like Corpacancha (2 Haciendas, 53,649 Has.) all dedicated almost exclusively to livestock (sheep especially), are efficiently operated. They have contributed to the economic development of the area in many ways, like improving the local sheep, assisting the neighboring Comunidades (Indian communities) with an informal extension service, training people, supplying meat to the people of the area (in the case of Cerro de Pasco Corporation at subsidized prices to the miners of the Company and their families) and finally, paying relatively good wages to the farm laborers.

The structure of these efficient types of haciendas might, however, obstruct development in different ways: a) insofar as all the available

land is not fully used or is not used in the best economic way inasmuch as the haciendas are contented with extensive types of operation, b) insofar as they do not help to develop among their workers a sense of responsibility, self-reliance and do not offer the farm worker a real possibility of improvement and advancement up the ladder, and c) insofar as the hacienda income is not somehow shared with the farm workers and not invested in any significant part in the area.

Enterprises like Cerro de Pasco Corporation did reinvest in the area, in fact it seems they were investing more in farming than the profit they were actually getting from the farm operation. In this specific case, however, the subsidy to the farm operation was coming from the profits of the mining operation. Farming was considered as an instrument to increase mining efficiency because it provided better and larger food supplies to the miners keeping them better fed and more contented because the low food prices acted as an increase of their real net income.

It is not easy to determine whether or not the above mentioned possible obstacles exist in this type of hacienda in the area. Existing reports appear biased and direct information through interviews may also be biased. However, it seems safe to say that land could possibly be used more intensively and that the sense of self-reliance and responsibility among the farm workers is not especially enhanced. Reinvestment in the farm operations is done, profits however (except in the case of Cerro de Pasco) go almost entirely to the landowners, and are expended outside the area. But there exists some income distribution through the relatively good salaries which are above the mean farm salaries paid in the area.

There are in the area other types of agricultural and livestock operations obviously inefficiently operated and partly abandoned and where the farm workers are poorly paid. Most of these enterprises are owned by absentee landlords who left the administration of the haciendas to the care of foremen and administrators who often are incompetent.

This latter type of haciendas obstructs development at various levels depending on the degree of resources misuse and maldistribution of income.

2. Defects within comunidades

Theoretically, the economic structure of a comunidad presupposes common ownership of the land and private ownership of implements, livestock, and product. In practice, the right to use the land, specifically agricultural land, has become a pseudo-right of ownership and land is transferred from parents to children through inheritance. Common ownership of pasture land is generally still in force.

The Constitution of Peru, intending to protect the Comunidades, states that ownership of the land of the Comunidades cannot in any way be alienated from the Comunidad. This legal prescription has been an obstacle to development. Banks have not been willing to loan money to the Comunidades or to individual members of the Comunidad for lack of a guarantee based on security. Loans, therefore, are difficult to secure even from the Agropecuario Bank, owned by the State. The consequence has been that individuals have asked for loans only for emergencies and almost never for agricultural and livestock improvements, and generally from the money lenders who have mercilessly exploited them.

Common ownership of pasture land impairs the sense of responsibility of individuals and, practically, there are no pasture improvement and land conservation practices used. Pastures are overgrazed and left in such poor conditions that they have to be abandoned for long periods. This fact together with an excess number of sheep for the available land has impelled some Comunidades to invade land belonging to haciendas which has generally been more rationally exploited than the Comunidad land. After a short period of invasion, however, hacienda land has become as impoverished as the old Comunidad land was.

Because the livestock belongs to individuals while the land does not and there is no restriction on the number of animals one can graze on the communal lands. The individual members of the Comunidad have tended to increase the number of their flock without any consideration of the available land and rational grazing practices.

Of course, the main reason for the individuals to increase the number of their own livestock has been the low productivity of the animals. More than 50 per cent of the Comunidades of Pasco and Junin area (according to the 1962 survey (16) have a mean production of less than 2 pounds of wool produced per year and per sheared sheep. The other 50 per cent does not go much higher above 2 lb. and none reach the average of the haciendas which is 6.5 lb. The Comunidad that has the higher mean production of wool in Marcapomacocha with 3.4 lb. No other Comunidad reaches 3 lb.

The same low productivity per animal is found in the average kilograms of meat per sheep slaughtered. Only one Comunidad out of 60, Jatunyacan, has a mean of 13 kilograms (1 kg. = 2.205 lb.); 9 Comunidades have a mean

of 12; 17 Comunidades have a mean of 11 kgs.; 22 Comunidades have a mean of 10 kgs.; 8 Comunidades have a mean of 9 kgs.; 2 Comunidades have a mean of 8 kgs. and one Comunidad has a mean of 7 kgs.

Comunidades lack capital and technical knowledge. As stated earlier, communal structure is partly responsible for the lack of credit facilities. How much this structure is also responsible for the lack of an organization which could facilitate the utilization of technical innovations in case these were available in spite of the capital shortage, is not easy to judge.

Production organization is basically individualistic in spite of the case often mentioned of the mutual help among "comuneros" for specific agricultural activities at determined times. There is no production planning, no association to work in common all or part of the land, to sell the products, to buy inputs and to care for the livestock. Some Comunidades have organized, often without much success, cooperatives of different types and communal livestock farms in which as a rule only few participate. For many in the Comunidad as well as outside, the cooperative organization is thought to be alien to the Comunidad spirit and even obnoxious. The reasons given, however, are not convincing and often are based on a misconception both of the cooperative system and the Comunidad as it exists today. Minifundia and dispersion of efforts, therefore, characterize the actual production structure and organization of most of the Comunidades.

Moreover, Comunidades are isolated entities at times deeply separated one from the other because of litigation and antagonism. Social and economic development can hardly be attained without cooperation between Comunidades leading to joint enterprises and common policies.

3. Related defects

The Pasco and Junin area has means of communication and transportation that although they need substantial improvements, are not completely inadequate. There are also marketing centers which could absorb easily the agricultural and livestock production of the area. The markets are located mainly in the towns of Cerro de Pasco and La Oroya (mining districts), Huancayo and especially Lima with its population of above 2 million and with Callao harbor open to international trade. Meat has a large potential market. For example, Peru had to import 40,074.7 M.T. of meat in 1963.

The problem is therefore not the market demand but the entire structure and organization of these markets. Large haciendas have the marketing problem satisfactorily solved because they deal with large quantities and possess outlets and the means of transportation. But Comunidades and generally small farmers have to sell through the middlemen, or go themselves to the local markets or to Lima to try to sell their products directly with the result of much time lost, often finishing with part of the product unsold and as a rule getting low prices.

Tradition and routine, combined with lack of an efficient extension service, lack of credit facilities and lack of supplies of fertilizers, selected seeds, selected breeds and sanitary facilities, result in poor crops and poor livestock products both in quantity and quality.

Lack of knowledge of market requirements and coordination in production plans result often in a poor use of scarce resources with temporary over-productions.

Although the land in the area, particularly in the Sierra, is of poor quality, it appears that it could be better utilized if a more adequate rotation system and fertilizer use could be established. In the 1962 survey (16) in the 31 Comunidades which had crop land, it was found that most of them did not use more than 20 per cent of their cultivable land each year (Table 4). In some Comunidades only 4.16 and 5 per cent of the land was used. The three Comunidades which were using more of their cultivable land, used 40.81, 33.88 and 33.55 per cent respectively.

Illiteracy in the strict sense of people unable to read or write, in the area is not as high as in other parts of Peru,¹ but the educational level of the large majority is very low. Few in the area have received higher agricultural technical education and as a rule one who receives it does not go back to his own village and not even to the area. Tarma Valley and Chanchamayo are exceptions to this rule, where also a more developed and productive agriculture exists.

The general low educational level makes it more difficult to impart technical instruction and to develop an effective extension service.

Living conditions are poor for the large majority of the population of the area. There are poor and inadequate housing facilities, deficient nutrition and abuse of "coca" and alcoholic beverages (Table 5). These poor conditions have an impact on the health of the population and consequently affect adversely work productivity.

¹The Regional Census finds a mean of 32.8 per cent of heads of families to be illiterate, with the range of 48.5 per cent at the top (Comunidad de Cajamarquilla) and, 10.1 per cent at the other end (Comunidad de Yurajhuanca which has 80.4 per cent of its active population in non-agricultural activities). The Comunidad following Yurajhuanca has 21 per cent while the large majority of Comunidades are situated between 30 and 40 per cent bracket.

Table 4. Crop land in crops and fallow in 31 Comunidades of the Pasco department, year 1962^a

Comunidad	Total crop land ^b	Crop land in crops ^b	Percentage of total crop land in crops
Chacayan	1,430	300	21
Chango	798	148	18.55
Mito	98	40	40.81
Yacan	600	105	17.50
Paucar	1,500	400	26.66
Tangor	640	95	14.84
Antapirca	700	150	21.42
Tusi	2,523	105	4.16
Pillao	2,000	515	25.75
Michivilca	447	150	33.55
Tapuc	2,502	430	17.80
Cuchis	644	164	25.46
Vilcabamba	1,100	208	18.90
Huaylasjirca	431	73	16.93
Rocco	382	65	17.01
S.P. Yanahuanca	1,820	296	16.26
Yancocha	3,000	150	5
Chaupimarca	3,500	510	14.57
Huachon	650	190	29.23
Quiparacra	1,500	290	19.33
Chinchán	2,400	600	25
Huariaca	2,125	720	33.88
Yarusyacan	1,900	420	22.10
Ninacaca	656	150	22.86
Pallanchacra	700	125	17.85
Paucartambo	1,500	400	26.66
Sunec	982	165	16.80
Ticlacayan	1,000	250	25
Yanacachi	280	70	25
Gajamarquilla	400	100	25
Huamanmarca	324	80	24.69
Totals:	38,532	8,264	21.4

^aUnpublished data. Agrarian Reform Institute, Central Sierra Survey, 1962 (16).

^bIn hectares.

Table 5. Standard budget for a family of five in two sampled areas in the Pasco department^a

Total yearly expenditure for:	Areas	
	Yanahuanca	La Quinua
Food	2,342.30	3,876.60
Alcoholic beverages, coca and tobacco	1,200.00	1,824.00
Clothing	925.00	894.00
Total in soles ^b	4,467.30	6,594.60
Total in dollars	167.00	260.00

^aSource: unpublished data - Agrarian Reform Institute Central Sierra Project (24).

^bMoney values at market local prices in 1964. The rate of exchange was 1 dollar = 26.80 soles.

The methodology used to obtain the data in Table 5 is as follows. First an attempt was made to determine the products and services utilized during the year by the family, including quantities and prices. The prices were local prices. Normally, the local prices of locally produced products such as potatoes (the base of most meals in the Sierra) are lower than in Lima and in USA.¹ This should be considered when viewing these figures,

¹In the area the average price of potatoes is 0.80 soles per kilo or almost 3 cents of a dollar (1.36 cents of a dollar for a pound) the average price in Lima is double this, namely 1.60 soles.

but even considering this, the figures are very low. These data are estimated to be valid for 75 per cent of the communal population. The remaining 25 per cent have a higher level of consumption.

It is interesting to note that the amount spent for alcoholic beverages, coca, and tobacco is over one-half that spent on food in the Yanahuanca region and nearly one-half in the La Quinua region. Speaking of cost and not of volume, it is evident that food items (most of them locally produced) are a good deal cheaper than alcoholic beverages, which normally are not produced in the region and therefore have the added cost of transportation and commercialization.

The students at the Centro de Capacitacion Campesina in La Quinua¹ were asked what they thought would be necessary to adequately feed and clothe a family of five each year.

The results translated in money terms at local prices were the following:

Food	S/. 15,804.00
Clothing	<u>5,500.00</u>
Total	S/. 21,304.00

In another survey made in 11 communities by agrarian reform personnel (24), the people interviewed estimated that an average of 13,446 soles for food and 5,454 soles for clothing per year or a total of S/. 18,900 would be adequate. This represented only what they thought a family of five

¹Farmers Training Center established in the Central Sierra by the Agrarian Reform Institute in 1964.

needed. It did not represent what they actually spent.

The official estimate of the Agrarian Reform Institute in Tarma is that S/. 25,000 is the minimum necessary for a family of five in the Sierra. However, the statistics show that in Yanahuanca less than one-fifth of this amount is actually spent (or equivalently consumed when not bought but home raised) per year and in La Quinua a little more than one-fourth this amount is spent (or equivalently consumed).

As far as food is concerned, the money value is not so important, what is important is the caloric and protein content of the food used. A very rough approximation based on FAO studies (7) indicates that the caloric content of an average daily ration for the family of five considered above for la Quinua area is 7,800 to 8,000 calories. The requirement for such a family according to the FAO studies would be approximately 13,100 calories (8, p. 44). Deficiency in protein requirements is much greater than caloric deficiency if the FAO-WHO findings are applied to this particular situation (10).

Low income of the large majority of the people of the area restricts the possibilities of an expanding market for both industrial and agricultural products. This is the typical feature of underdeveloped countries and the great stumbling block for the expansion of the industrial production sector for home consumption goods.

To appreciate better the income levels in the area it will be appropriate to present here the findings of the Regional Census on this matter.

The population of the two zones (Yanahuanca and La Quinua) that the

Regional Census studied were stratified into four groups using the principal and secondary occupation of the head of the family as the base. See Table 6.

Table 6. Family and individual average yearly net income in two areas of Pasco Department^a

Group	La Quinua		Yanahuanca	
	Family	Individual	Family	Individual
	Soles ^b	Soles ^b	Soles ^b	Soles ^b
1. Exclusively engaged in agricultural activities	4,743	1,134	2,000	515
2. Agricultural occupation as principal but with a secondary occupation elsewhere	7,648	1,493	3,674	747
3. Agricultural occupation as secondary; principal occupation elsewhere	12,521	2,198	10,582	2,202
4. Non agricultural occupation	11,282	2,526	9,521	1,738

^aUnpublished data. Regional census. Agrarian Reform Institute Central Sierra Project (24).

^bIn soles (26.8 soles = 1 dollar).

Looking at Table 6, it clearly appears that Yanahuanca region is poorer than La Quinua region. This fact was also apparent in Table 5. The source of the two tables is different. Table 6 is the result of the Regional Census, while Table 5 is a result of a survey undertaken independently of the Census, thus the two sources confirm the same fact.

People exclusively engaged in agricultural activities have in both regions a lower income than any other group. This group in Yanahuanca not only has an income less than one half of the income for the corresponding group in La Quinoa, but it has a larger percentage of its population in the exclusively agricultural group than La Quinoa (37.74 per cent in La Quinoa, 63.2 per cent in Yanahuanca) (see Table 1).

It is worth noticing that the differences between family incomes among regions in the same group and in the same region between groups are greater than between individual incomes. This point will be pressed further in Chapter V.

In every group the income is higher than in the preceding one, except for the family income of group 4 in La Quinoa, and for the family and individual income of the same group four in Yanahuanca. It is necessary to consider when viewing this last group that it was not possible to obtain all the income information from this group, and thus in many cases some income may not have been declared. For this reason the recorded averages in group 4 are probably lower than they should be.

Maybe the most challenging new factor appearing in the scene in underdeveloped countries and specifically in the area under study is the rising of expectations and the impact of "demonstration effect". Peasants are realizing through modern communication channels that others are living under better conditions than they are. Also, political propaganda and well intentioned local and foreign experts of international organizations are telling them that things could be better for themselves, too. All this is having an impact even on the fundamentally passive Indian.

The impact is shown in different instances such as: a) Emigration principally to Lima which occurs mainly not because jobs are available in the city, often they are not, but because they want to escape the miserable conditions of the rural area. There is also a strong emigration towards the high jungle (Ceja de Montana) where conditions are not as difficult as in the Sierra and where there seems to be better employment opportunities.

b) Invasions of haciendas land: The climate of agitation was ever present in the early sixties and especially in 1962 and 1963. Promises of agrarian reform and some shows of force of the Army under government orders, quieted down the invasions and uprisings.

c) Desire for education as a means to get other jobs than agricultural ones and escape from agriculture. The typical answer we got questioning parents as why they were sending their children to school, especially to secondary school, was that they do not want their children to work in the fields.

d) Desire for acquiring modern conveniences even if this means to go hungry for awhile. Transistor radios, record players when electricity is available, and a lot of other, mostly imported modern devices, are a common sight in poor villages and houses.

This revolution of aspirations is putting heavy pressure for immediate change. The pressure is increased by the political awareness of the masses exploited by the action of political groups working for their own interests. In this way a climate for immediate accomplishments is created. It does not seem impossible to use this drive for constructive purposes, for social and economic development. However, to channel this driving force into the right direction is admittedly not easy. Improvements are expected right now. Urgency and thoughtfulness are not frequently at ease together.

C. Formulation of Hypotheses

The two first parts of this chapter dealt with the physical, economical and population conditions of the area delimited by the study and with the defects in agricultural structures which obstruct development. This third part (C) of Chapter II will deal with the formulation of hypothesis that seems relevant both to the diagnosis of the situation and to its probable solution. The hypotheses thus formulated will guide the effort throughout the following chapters.

1. Role of hypothesis in inquiry

The American College Dictionary gives the following definition of hypothesis: "a proposition (or a set of propositions) proposed as an explanation for the occurrence of some specific group of phenomena, either asserted as merely provisional conjecture to guide investigation, a working hypothesis, or accepted as highly probable in the light of established facts."

The Encyclopaedia Britannica defines hypothesis as something supposed or taken for granted, with the object of following out its consequences. The word hypothesis is from the Greek "ypotiphenai", which means to put under; in Latin the same word is translated into "suppositio", from "sub" and "ponere".

The most important modern use is in relation to scientific investigation. A scientist is not merely concerned to accumulate such facts as he can discover by observations; he wants to discover the linkages between facts. He is guided by some problem which puzzles him; but he needs to have some clue as to what facts will help him to solve his problem. His best guide is a tentative

hypothesis, which fits in with the existing body of doctrine and which is so framed that with its help he can deduce that under certain factual conditions (initial conditions) certain other facts would be found if the hypothesis were correct (6, Vol. 12, p. 248).

Historically, hypotheses have been used in mathematics to demonstrate new propositions in a logical way. In Economics, hypotheses can be used not only as a logic exercise in purely analytical theory but also as a powerful means for advancement in the search of practical solutions.

Hypotheses as a tool of economic investigation have been used and developed in the elaboration of a program of research conducted by Iowa State University in Peru (34, pp. 21-22). The present writer believes that he can do no better than to make use of this category for his own inquiry.

According to this methodological framework there are the following types of hypotheses entering into the process of inquiry: delimiting, diagnostic and remedial.

The logic of such a conceptualization is seen as soon as we consider the process of inquiry. For, first, there must be some delimiting of the scope. One cannot investigate or solve all problems unless one has unlimited time and resources at one's disposal. This delimiting stage itself embraces three main substages:

- a. definition of the purpose or end-in-view. It is the "terminus ad quem", the "where-we-want-to-arrive".
- b. departure point, that is to say, the existing situation from which we take our departure.
- c. determination and measurement of the gap between a and b.

Substages one and two lead themselves to hypothesization. One can make different suppositions about what is to be achieved based on the possibility and advisability of applying the means to attain it.

Similarly, one can suppose the situation which exists to be such or such. Whatever the supposition, however, it has to be tested and supported by an analysis of the reality.

In this first phase of inquiry other hypotheses of a more general nature than the ones included in the three substages have to be made. Examples are: acceptance of the purposes or ends-in-view by the people concerned; willingness to apply the means to attain the goals by whoever has to apply them; dissatisfaction with the actual situation, objectively and subjectively considered; and so forth. Many of these general hypotheses are either evident or will have to be taken as given in order to limit the research to a manageable form.

Once the purpose is clearly stated and delimited and the existing situation recognized, diagnostic hypotheses about the problems involved in opening or closing the gap, or on the reasons why the gap is of such specific nature, can be formulated.

Diagnosis will normally concentrate on the success and failure elements which have shaped the actual situation and which are responsible for the existing failure to reach the purpose assumed as an end-in-view.

The testing of diagnostic hypotheses is not easy, particularly because the various elements do not act in isolation but are inter-related, and also because some key element might not be apparent at first sight.

Wrong diagnosis leads to wrong solutions; to remedies which far from

curing rather serve to increase the difficulties and to spread frustration and dissatisfaction both among the people concerned and in the mind of the researcher.

Correct diagnosis, on the contrary, is already one-half of the solution. It will lead to a correct formulation of the remedial solutions which will follow. These, because based on correct diagnosis, can, after careful testing, be proposed for application with confidence as to their reliability.

2. Delimiting hypotheses

This study is delimited to the economic aspects of agrarian reform, especially to agrarian reform in the Central Sierra of Peru as a means of economic development. This delimitation is in accord with the stated objective of this study (Chapter I, G). The hypothesis in which the delimitation is based is that one of the purposes of agrarian reform in Peru is the economic development of the nation, and that if this purpose is not attained the other purposes will not be attained either.

The Peruvian Government may obviously have several ends-in-view for carrying on the agrarian reform. These various ends-in-view, we may assume, are mainly of a social, economic and political nature. In the study it is assumed that no matter what other ends-in-view the Government of Peru may have, economic development as an end or purpose is necessary, in the sense that the Government is not willing (nor can it afford) to sacrifice economic development as guidelines in the implementation of agrarian reform.

Proof that the assumption is correct rests on the first article of the Peruvian Agrarian Reform Law which states:

Agrarian reform is an integral, peaceful and democratic process for changing the agrarian structure of this country and promoting our economic and social development by substituting the system of excessively large and small estates for a just system of land ownership, tenure and operation that will serve to increase production and productivity of the land, complemented with timely and adequate credit, technical aid and marketing and distribution of the products in such a manner that the land becomes a basis for economic stability, the foundation of progressive welfare and the guarantee of the dignity and freedom of the man who works the land.

The political and social aspects of agrarian reform are obviously very important, but they can hardly be attained without the attainment of the economic objective. In fact, the farmers receiving land will have little lasting satisfaction if the land does not provide them with better income levels. Nor will the national and particularly the non-farm sector objectives be satisfied if the agrarian reform investment effort does not result in general economic development.

The study is further delimited to the Central Sierra of Peru where priority has been given by the Peruvian Government for the application of the Agrarian Reform Law.

3. Diagnostic hypotheses

The Peruvian Legislature having enacted an agrarian reform law in which structural changes of the agricultural sector and economic development are the objectives, has implicitly diagnosed that the actual agrarian structures are not conducive to economic development. The analysis of the agrarian structures presented in this Chapter II, B, and in Chapter I, C, confirm this diagnosis. Further, the legislature had diagnosed that

transformed or new agrarian structures can facilitate economic development.

Land tenure structure is the outstanding structure which the Law requires to be changed, but it is not the only one mentioned, (see the first article of the Law). It is clear therefore that the Law does not conceive agrarian reform as mere land redistribution, however, there is a danger of interpreting the Law and implementing it as if land redistribution was the main and practically the sole objective. To help avoid this danger a hypothesis to this effect will be formulated here and tested in Chapter V. This hypothesis is as follows:

a) "Agrarian reform conceived as mere land redistribution is not going to solve the problem of the agricultural sector of the Central Sierra".

With the data presented in Chapter I, 3 for the entire country, the preceding hypothesis has been tested as far as an equal redistribution is concerned. The aim however, is to test to the extent that, even or uneven distribution, if it is not more than that, is not going to solve the problem.

Further the following hypothesis is formulated:

b) "Agrarian reform if it is to help in any significant way to solve the problems of the Central Sierra of Peru has to be conceived primarily as an instrument for economic development of the area and the nation".

This hypothesis follows from the basis established for the delimitation of the study to the economic aspects of agrarian reform (II, C, 3) and somehow has been tested already in Chapter I, page 14, and will be further tested in Chapter V.

4. Remedial hypotheses and how these hypotheses will be tested

The remedial hypotheses follow the diagnostic hypotheses. If, therefore, the agrarian reform is going to contribute to economic development through new or reformed structures because the present ones are not conducive to economic development, then the purpose of agrarian reform has to be the creation and establishment of suitable structures for economic development. Furthermore, the existing intervening gap between the present agricultural situation and the situation of an agricultural sector that positively contributes to economic development has to be filled by pertinent agrarian reform programs implemented in a period of time as short as possible and with the best use of the scarce resources that the agrarian reform organization possesses. On these premises the following hypotheses are formulated:

c) "Agrarian reform will be a successful instrument to bring about economic development insofar as the new structures thus created are carefully selected and adequately constructed. An efficiency model can help to test the structures as to their adequacy to contribute to the economic development goals".

d) "The implementation stage of the agrarian reform proves to be a difficult and slow undertaking, but can be expedited with the use of an action planning model in the vein of Critical Path and PERT methods."

Hypothesis c) will be developed in Chapter III where the model will be constructed and in Chapter V where the proposition will be tested.

Hypothesis d) will be developed in Chapter IV, where the model will be presented and in Chapter V where the proposition will be tested in the

context of the agrarian reform law implementation in the Central Sierra.

A final hypothesis will be presented to satisfy the remaining objectives of this study which can be stated as follows:

e) "There are some suitable alternatives for the solution of the problems that the present application of the agrarian reform law encounters in the vital aspects of land expropriation and land valuation".

These final hypotheses will be tested at the end of Chapter V as an outgrowth of the agrarian reform experience in the Central Sierra.

With the testing of these hypotheses the objectives of the study stated in Chapter I are expected to be attained. These objectives were as follows:

1) General objective: To analyze the conditions under which the agrarian reform in the Central Sierra of Peru can be instrumental to economic development,

2) Specific objectives: a) To develop a model which could help in the selection and construction of the new structures in light of their efficiency in the attainment of economic development. b) To apply an action planning model in terms of Critical Path and PERT methods to the agrarian reform process. 3) To offer some alternatives for the solution of the problem that the present application of the Agrarian Reform Law encounters in the vital aspects of land expropriation and land valuation.

III. EFFICIENCY MODEL FOR TESTING AGRARIAN STRUCTURES AS TO THEIR ADEQUACY TO CONTRIBUTE TO THE ECONOMIC DEVELOPMENT GOAL

As stated before, agrarian structures are considered as variables, man-made and capable of being changed by man. This basic fact gives meaning to our research, for it would be of little value to find out that a specific structure helps or is an obstacle to economic development, if after all, nothing could be done about it.

Recommendations to policy makers derived from the research results of this study are based primarily on economic considerations. The policy makers, however, have to consider in their totality the problems involved in applying the recommendations as far as changing, improving or maintaining determinate structures. It is not impossible, therefore, that the policy maker finds that other non-economic variables weigh more than the economic ones and consequently the recommendations cannot be followed as they are proposed. Whenever that happens, new recommendations have to be worked out which have to take into account the non-economic considerations which act as restrictions on the achievement of economic policy goals.

The efficiency model presented here has two parts, as follows:

The first part has to do with the determination of the targets or objectives of the agricultural sector in the over-all national economic development. In this part it should be clearly specified what contributions are expected from the agricultural sector to the general economic development of the nation.

In the second part, agrarian structures are analyzed and designed in

the light of the objectives of the first part. In other words, this second part intends to identify, discover, develop or otherwise build structures which could be instrumental to the economic development role assigned to the agricultural sector.

The first part can be carried out relatively easy when there is a national development plan that assigns specific roles to the different sectors of the economy at the national and regional levels. Then the targets are already specified in their roles for policy guidance.

Oftentimes, however, there is no national development plan, or it is too general for the purpose of providing targets for the model. In this case the potentialities of the agricultural sector, the national needs of agricultural products and the resources with which the agricultural sector could contribute to the general development process have to be determined before any meaningful objectives can be established.

In Peru there is not yet a national and regional development plan that can be used to determine the objectives of the agricultural sector in the Central Sierra. Until a more comprehensive plan comes into existence the following approach could be used for the establishment of the targets in the Central Sierra.

- (a) Appraisal of the agricultural potentialities of the area.
- (b) Estimate of the regional, national and international markets (actual and potential in the near future) for agricultural products that could likely be produced in the area.
- (c) Estimate of the other contributions that the agricultural sector could make to the general economic development.

In (a) the following steps are taken:

(1) An estimate of the actual use and potentialities of the available land in the area. This is a technical appraisal that has to be made by agronomists, soil specialists, livestock specialists and other technicians. The technical appraisal can be done at different levels of approximation. Generally there will be neither sufficient time nor enough resources available for an exhaustive survey and consequently only approximations will be obtained from the appraisal.

If land is found which is not actually in use but could be used for agricultural purposes, the cost and required time to put it into operation is also estimated.

(2) An estimate of the actual productivity levels for different crops presently grown under different farm organization systems, like "hacienda", individual farmers and "Comunidades".

(3) An estimate of the production costs for different crops grown under different farm organization systems.

In (b) at least an approximation of the effective present and potential demand for the agricultural products of the area has to be achieved.

It is possible that the present and near future needs of the existing markets do not coincide with the supply of products for which the land of the region is most suitable. In such a case, alternative physical production possibilities have to be considered in the light of the effective demand.

The model could make good use, in this first part, of the linear

programing techniques, considering all the possibilities and restrictions. However, it is beyond the purpose and limitations of the present study to develop further this part of the model with linear programing techniques.

Once the investigations set forth in (a), (b) and (c) have been made at the best possible level, targets or objectives can be established for the Agricultural sector in a specified area.

No systematic investigation of these three points (a, b, c) has been made in the Central Sierra because of data limitations. Therefore, only broad targets can be established here for the agricultural sector of the Central Sierra.

Three propositions are thought to cover the fundamental points which have to guide the structural changes in the Central Sierra through the agrarian reform process. These propositions are:

- (A) Increase agricultural and livestock production,
- (B) Increase the efficiency of the production factors, and
- (C) Transfer production factors, especially manpower intra-sectorally and extra-sectorally, according to the different sector needs and consistent with a balanced national economic development.

These three propositions will be taken as targets. Each one will be further specified presently.

(A) Increase agricultural and livestock production: The proposition is based in part on the demand and in part on the actual possibility of production increase.

The unsatisfied demand is clear in the case of meat. Peru is importing meat for home consumption (40,074.7 M.T. need to be imported in 1963,

(36, p. 141). Furthermore, it is estimated that a large part of the Peruvian population is eating very little meat because it is not available or the price is too high for their budgets.¹ However, one of the main activities of the Central Sierra is livestock raising.

In the case of other productions typical of the Central Sierra like barley, potatoes, and oca, it does not seem there will be a problem of shortage of demand for them if production is increased, but rather a problem of storage and market facilities. For vegetables and generally for truck farming, products, produced in the Central Sierra (Tarma Valley, Jauja and Huancayo) the demand should continue to increase if income of a large part of the population increases, and if the income elasticities of demand in Peru are similar to the ones in other parts of the world (30, pp. 71-73).² Problems, however, might arise due to marketing deficiencies and to lack of production planning among producers which can lead to surpluses and shortages at times.

Estimates of the precise increases of production in kind and magnitude required to satisfy the demand will not be easy to make with available knowledge. Tentative approximations, however, might prove to be good enough in the beginning.

¹Total consumption of meat (produced + imported) for 1963 was 206,576.3 M.T. (36, p. 142). As an average therefore, each individual in Peru ate 18.-kgs/year or 49.2 grs. daily, equivalent to 1.74 oz.

²H. Van de Wetering has recently estimated that an annual increase of 19.08 per cent of supply of vegetables and an increase of 6.68 per cent of supply of tubers is needed between 1963 and 1970 to meet nutritional standards of an ideal diet in Peru in 1970 (38, p. 6).

Fernando Belaunde, the President of Peru, set up as an overall objective for Peru in the amount of an increase of 33 per cent of agricultural output for the period 1964-70 (3, p. 451). Given the actual levels of production in the Central Sierra it does not seem difficult to reach the President's quantified target in the area. If the Comunidades could attain the production levels of some of the haciendas and the production level of the haciendas' land that will be expropriated could be maintained, the increase in output could very easily be greater than 33 per cent in the period ending in 1970.

Further, as it has been seen, not all available land is actually used (see preceding chapter, Table 4), and large percentages of labor are also underutilized.

In the study of Comunidades carried out in the Central Sierra by the Agrarian Reform Institute termed the Regional Census in the preceding chapter, the following excessive man-day utilizations were found in 25 Comunidades of the Pasco Department where cattle raising is the principal activity (see Table 7).

(B) Increase the efficiency of the production factors: The low productivity of the livestock of the Comunidades has been seen in the preceding Chapter (II, B, 2). Likewise, the low productivity of labor and capital can be shown. In fact, the study of Comunidades in the Central Sierra, cited earlier as the Regional Census, shows for all Comunidades studied that the average gross agricultural productivity (crop and livestock combined) per man-day was only 11.87 soles in 1963-64 with a range from S/. 2.78 in the Comunidad of Huayllay, to S/. 35.95 in the Comunidad of San Pedro de

Table 7. Inefficiencies in the use of manpower in 25 Comunidades

Number of Comunidades	Percentages use of excess man-days ^a
6	90 to 95
4	85 to 89
8	80 to 84
3	75 to 79
2	70 to 74
2	65 to 69 ^b
25	

^a By excess man-days it is meant the number of man-days worked which could be saved if the cattle operations were operated in a more efficient way, as under bigger units and without using more labor than it is considered necessary by the efficient Haciendas of the area for a given number of cattle.

The formula used is:

$$\frac{(U - N) \times 100}{N} = \%$$

where U = number of man-days used
N = number of man-days needed.

^b The range was from 65.22% in the Comunidad of Paucar to 95% in the Comunidad of Chaupimarca.

Racco. (Rate of exchange is 1 dollar equals 26.80 soles).

The gross average productivity per man day in the Algolan haciendas was in the year 1963, 178.63 soles. In the Algolan haciendas, farm accounts were well kept and, therefore, all gross income was registered, while some underestimation might have taken place in calculating the Comunidades' gross income. On the other hand, the man days per year has probably been

overestimated in the Algolan haciendas. In fact, of the 380 men working in the haciendas it has been supposed that all of them had worked 365 days, which is not true at least for the workers and foremen.

A study done by the author in several Comunidades on the net productivity of the capital invested in livestock production by those Comunidades shows returns of less than one per cent (0.8 to 0.9 of one per cent). This is a very low rate of productivity for the capital, especially when it is considered (1) that only the capital invested in land (estimate price of the land at prices set by the agrarian reform valuation methods), in livestock and some installations (corrals only) was taken into consideration, (2) that the imputed salary to labor was set at the low level of 15 soles per day, and (3) that no other expenses than labor were considered.

What in fact was considered in the preceding calculation was the fixed capital of land and installations and the variable capital, or more exactly the short term fixed capital, livestock. (The calculation of the livestock was done on the basis of an average number of heads, disregarding the increases and decreases which took place during the year). In order to estimate the net income with precision all the costs should be taken into consideration (fixed and variable costs). Apparently there are no fixed costs that can be estimated in this case. Taxes are not paid, the rent paid by the members of the Comunidad was considered as income to the Comunidad not as a cost because the over-all revenue of the Comunidad was the relevant point. There were some fixed costs for the outkeeping of the installations, but these appear to be small and certainly difficult to estimate. There are no land conservation practices, rather there is disinvestment with the

destruction of pastures due to the overgrazing practices which are the result of the excess number of livestock in relation to the supportability of the land. The care of the livestock represents to a certain extent a variable cost in relation to the number of livestock. The main part of this cost is in the form of labor wages, (paid or imputed). The other variable costs, like sanitary practices and the like, are, it seems, of some importance in spite of the actual low technical levels of production maintained by the Comunidades. Those costs, however, could not be calculated for lack of reliable data. This is the reason why only labor expenses were taken into consideration.

The net productivity of the capital invested in the Algolan haciendas was for the year 1963, 4.95 per cent. The estimate is based on the selling price of the Algolan haciendas and actually paid by the Peruvian Government, which includes land, roads, channels, drainage and other infrastructure improvements, buildings, furniture, equipment, telephone installations, and so on. If, however, the price stated in the Algolan books is taken instead of the price actually paid, the net productivity of the capital expressed in the price, would be about 4 per cent. For a more exact evaluation of the difference between the productivity of the capital invested in the agricultural operations of the Comunidades and in the haciendas, it has to be pointed out that the net income taken as a base for the calculation of the productivity of Algolan invested capital, was the net income after taxes were paid (taxes amounted to S/. 1,158,396.75). In the Comunidades no tax deduction was made simply because Comunidades are tax exempt, and consequently do not pay taxes.

From comparisons among Comunidades and much more between Comunidades and haciendas, it seems that there is a good possibility of improvement of the productivity of the production factors in the Comunidades.

Here, it can be asked why some Comunidades are more efficient than others, and why some haciendas are much more efficient than Comunidades in the use of the production factors. This question appears very relevant to the solution of the economic problems of the Comunidades. Further analysis on this point will be made in Chapter V.

A study of the marginal costs could also be of great help for the improvement of the economic efficiency of the production factors in the agricultural operations of the Comunidades. Scant and unreliable data, however, will prevent conducting this kind of study in Chapter V much beyond the conceptual stage.

More important perhaps would be a study of the different production functions with which the Comunidades are faced. On the basis of the actual knowledge of the Comunidades of the Central Sierra, it can be hypothesized that the Comunidades in their production functions are in the segment of increasing returns per new unit of input used in the form of new technology but they are in the falling segment or stage of decreasing returns in relation to the number of livestock in a given land.

Unless the productivity of the factors is increased, the cost of production per unit produced will be high, because more inputs are used than necessary for the same level of production, and although the prices of some of the extra inputs might be very low, like labor in some cases, nonetheless

there is an unnecessary addition to the cost. As a consequence of the high cost of production, the prices of the agricultural products will tend to be high. The main reason, however, for the actual high agricultural prices at retail level in Peru is the scarcity at times and always the high profits taken by the middleman. On the other hand, farm income will tend to be low because of the high costs of production, the low productivity levels and the limited power the Comunidades have to increase selling prices, all of which reduces the margin of profits.

(G) Transfer production factors, especially man power: Intra-sectorally and extra-sectorally, according to the different sector's needs and consistent with a balanced national economic development. An important part of the contribution of Agriculture to other sectors of the economy and to the general economic development in the economically developed nations was made through the transfer from agriculture of land, capital and man power (19, 22, 25).

Land was transferred from agriculture for the sites of cities, highways, airports, factories. Capital was transferred in the form of direct farm savings as capital claims or as forced savings like taxes, and indirectly through the industrial and service sectors' savings made possible by the low prices of the agricultural products. Some forms of embodied capital were also transferred like the expenses incurred in the upbringing of the transferred man power. Man power itself was transferred to industry and services to satisfy the increasing demand for it and allow the expansion of the industrial and services sectors.

Today's situation in underdeveloped¹ countries does not seem to parallel exactly the situation of the developed nations in a similar stage of development. This seems to be particularly true with reference to manpower surplus. For one thing, the demographic increase rate seems to be higher in the underdeveloped countries than it was in the developed countries in a comparable development stage.² Furthermore, most of the industries

¹Underdeveloped or less developed are comparative terms. An underdeveloped country is a country which is developed economically under what it could be. In this sense the Jacob Viner's definition could be used, "a country which has good potential prospects for using more capital or more labor or more available natural resources, or all of these, to support its present population on a higher level of living, or, if its per capita income level is already fairly high, to support a larger population on a not lower level of living" (39, p. 12). According to Viner's definition all nations, except the hopeless ones, are under developed. It is not, however, in terms of Viner's definition that we think when we employ the adjective underdeveloped. It is rather in the sense of poor nations - poorer than others. Surely these nations could use more capital and so on, but it is not this characteristic which places them in the category of underdevelopment but the distance they find themselves behind the more developed nations. Then the comparison is made in relation to the development of other nations in terms of the average per capita income, or in terms of per capita production of certain key products, like electricity, steel, cement and so on. If they do not reach certain levels, they are considered underdeveloped.

²The evidence of the demographic tempo difference rests on the data of the National Demographic Census of the developed countries referring to the past years when the economic development started, and on the other part on the National Demographic Census of the underdeveloped countries, published yearly by the U.N. Demographic Yearbook.

established in underdeveloped countries tend to adopt the labor saving methods actually used in nations where labor is scarce and expensive. Certain kinds of new agricultural techniques adopted in underdeveloped countries tend also to reduce the labor need in the agricultural sector itself.¹

Therefore, the labor available for transfer in the agricultural sector is larger than the demand for it. This surplus labor has become one of the most challenging problems of underdevelopment.

In most of the Central Sierra the agricultural sector is confronted with the problem of over-population in the sense defined by Georgescu-Roegen "a situation in which under conditions of full employment, the marginal productivity of labor falls short of the minimum subsistence of the worker" (12). This fact is easy to prove with the figures given above of the low average gross productivity of labor.

Furthermore, in the previously mentioned study of the comunidades, (Regional Census) it was found that 46.2 per cent of the total population is under 16 years of age. Tomorrow's outlook of over-population problems is therefore darker than the today's reality.

The agricultural sector, whether under the Capitalist (Mill-Marshallian) or under the Marxist-Leninist model, has always been forced to

¹New technology and particularly agricultural technology does not need to reduce labor inputs necessarily. Some types of technology increase outputs while increasing productivity of labor and the number of labor itself, for instance technology directed to the intensification of the use of land like fertilization and irrigation practices. There are, however, other types of technology which are purposely designed for labor saving (capital substituting for labor) whether it increases production or it keeps it at the same level, harvesting machinery for instance.

make a greater sacrifice for the general economic development than other sectors of the economy (25). In underdeveloped countries a further hardship seems to be imposed on the agricultural sector forcing it to keep and support the redundant farm labor. Conditions, however, may become so hard that substantial parts of the farm people might move into the cities, as it is actually happening in Latin America, even if the city cannot offer them any economically useful occupation.

Although economic problems of the general economy and of the agricultural sector will not be ultimately alleviated until the general economic development of the country takes place, it might not seem appropriate to completely subordinate the agricultural sector, and consequently the larger part of the nation's population to the general economic development.

Insofar as the latter consideration merits to be taken into consideration, a whole rethinking of the role of the agricultural sector in the resource transfer has to take place.

When for instance the release rate of labor from agriculture must be slowed down because other sectors cannot absorb it, agriculture should be provided with adequate means to do so. These means may signify a reverse of the traditional tax concept imposed on the agricultural sector.

The first part of the model is completed when the targets are determined. In the present case three basic targets have been identified.

- (A) Increase agricultural and livestock production
- (B) Increase the efficiency of the production factors
- (C) Transfer production factors, especially manpower, from agriculture

to other sectors of the economy, at a rate consistent with the general economic development of the nation.

Targets, however, might be competitive rather than complementary, depending on the circumstances of the agricultural sector in relation to other sectors of the economy.

In the case of the Central Sierra, for example, productivity and resources transfer appear competitive with respect to labor. Labor productivity cannot easily increase without having the redundant farm labor transferred. The transfer, however, is not possible, at least in substantial quantities, because there are not enough job opportunities outside the agricultural sector of the area.

In cases like these, workable solutions have to be found. The second part of the present model tries to find practical solutions to this and other problems.

In the second part of the model two questions have to be answered:

- 1) What are the crucial agrarian structures in the Central Sierra that could help most to attain the targets?
- 2) How should these structures be designed to maximize their potentialities in order to attain the targets and solve the possible conflicts among targets?

The answer to these two questions gives a set of conceptual structures suitable for practical application. The application to reality, however, will be conditioned by the limitations imposed by legal, social and political restrictions which cannot be changed in the short run. A time constraint, therefore, can put a limit to the perfect flexibility required for implementation of ideal solutions.

The first questions, namely what are the crucial agrarian structures in the Central Sierra that could contribute toward the attainment of the targets, will be answered here with an identification of structures, followed by an analysis of the inclusion of each of them.

The crucial agrarian structures seem to be the following: a) Land tenure arrangements, b) marketing facilities, c) credit facilities and d) technical assistance and educational facilities.

a) Land tenure arrangements: In the present study land tenure arrangements mean the form of land ownership, the rights and obligations connected with land ownership or land lease, land prices, the production organization and the extension and limitations of farm size.

All enumerated aspects of land tenure may greatly effect production, productivity and factor transfer. This can be easily understood and will be shown later.

b) Marketing facilities: The function of marketing is to bring the products from the producer to the consumer and reporting back to the producer, through demand and prices, the desires of the consumers. Marketing, therefore, performs a service both to the producer and to the consumer.

Marketing deficiencies discourage production and productivity in the part of the producer and may turn the consumer to other substitutes or to foreign imports.

The marketing structure advocated here as remedial is an efficient agricultural marketing organization which could operate at the lowest possible cost and which as a consequence could reduce the retail prices to the consumer while paying the highest possible price to the farmer for

his products. Furthermore, market facilities should be an efficient distribution system avoiding delays and waste, a sales promoter and above all an orientation for the production and a stimulus for the farmer to orientate his production toward the market, or in other words to help him out of the subsistence farming and introduce him into commercial farming.

c. Credit facilities: The function of agricultural credit is to provide the farmer with the means to finance agricultural operations and improvements which otherwise he could not be able to undertake. The facilities to obtain a loan, the term for which it is given and the price to be paid for it greatly influence the use of credit by the farmers.

The type of credit facilities envisaged here is essentially orientated toward development and well aware of the poverty and backwardness situation of the farmers. That is to say, credit is looked upon as an instrument to promote one type of crop rather than another, one type of improvement rather than another¹ in an over-all view of agricultural production planning for development. At the same time credit cannot be managed on the traditional commercial lines. In other words, it has to be cheap for the farmer, it has to be readily available when needed and it has to involve risks. The risks involved in innovations that the farmers undertake with credit should fall upon the credit agencies rather than upon the farmers, otherwise they will not innovate.

A credit system not established in these lines favors only a very small minority of farmers who can afford to pay the high interest rates

¹ For instance if there is surplus labor that cannot be transferred elsewhere, the credit should favor innovations which require labor intensive use.

and have the collateral demanded by the Commercial Banks. This type of credit does not help substantially the agricultural development in the conditions of underdeveloped countries.

d) Technical assistance and education facilities: Technical assistance to the farmers means a transfer of knowledge and technical skills about cultivation methods, livestock raising, farm building techniques and so on, as well as making available to the farmers the embodied technical innovations like machines, improved seeds, fertilizer and so on. The main purpose of technical assistance is to improve the production efficiency.

Cultivation and livestock raising methods are so primitive in the Central Sierra that the slightest improvement is liable to have an effect more than proportionate to the cost. Expressing the same thing in a more formal way, in most of the Central Sierra farms the production function with respect to technical innovations is in the more than proportional increasing returns segment.

In Peru as in most of the underdeveloped countries the limiting factor to technical assistance is not so much the cost of it as the availability of competent extensionists. Therefore, the technical assistance visualized here includes the organization effort to carry on an extension work by anyone capable of communicating his knowledge to others; therefore, farmers who might not have any formal training but know exceptionally well some cultivation technique and are able to communicate their knowledge to other farmers can be enlisted on the technical assistance team. A group of university trained extensionists, agriculturists and animal husbandry men would lead the effort and train others. This group should be especially gifted

and trained in human relations, capable of understanding and leading the farmers. Intermediate and low level extensionist training should be provided to farm people of the area who could be capable of assimilating the knowledge and capable of communicating it to others.

Education means to bring up, to develop and train the intellectual as well as the manual capabilities of a person. Economically it can be considered as an investment in the man power factor to make it more efficient.¹ Education completes technical assistance and in a sense conditions it.

The basic aim of the education facilities contended here is to train rural people in simple and useful skills needed for development and in how to get their minds to work as well as teaching them reading, writing and arithmetic.

Education plays a main role in the increased agricultural production as well as in the resources transfer, particularly manpower transfer from agriculture to other occupations.

Further ideas on the importance of education in the economic development effort are developed by authors like John Kenneth Galbraith in Chapter V of his book "Economic Development in Perspective" (11), Clifton R. Wharton Jr. in Chapter 10 "Education and Agricultural Growth: The Role of Education in Early-Stage Agriculture," in the book "Education and Economic Development" (40), Frederick Harbison and Charles A. Myers in their book "Education, Manpower and Economic Growth. Strategies of Human Resource Development" (13)

¹For a further discussion of this point see for instance, T. W. Schultz "The Economic value of Education" (31).

IV. ACTION PLANNING AND IMPLEMENTATION MODEL

The targets and the structures which could most likely help to attain the targets were presented in the preceding Chapter. The present Chapter will deal with the implementation stage in which the new structures are established and used as instruments to attain the targets. It is assumed that the targets previously identified and the instruments are embodied in an agrarian reform process and, therefore, the model to be presented here will refer to the agrarian reform implementation stage.

Many technically good agrarian reform laws prove quite inefficient or become completely paralyzed at the implementation stage. Apart from the positive action of large landowners and opposition groups to stop or make difficult the implementation of the agrarian reform, there is an intrinsic reason for the agrarian reform failure at the implementation level. This is the lack of a consistent and realistic action plan, with the consequence of improvisations, poor use of scarce resources, mistakes, delays and repetitions.

Much of the problem could be solved with the application of a good action planning model. This type of planning model should have the following qualities.

- 1) It should give an over-all view of the complexity of the practical application process of agrarian reform to allow an accurate evaluation of the magnitude of the undertaking at the starting point.

- 2) It should enable the agrarian reform policy makers to foresee all the resources needed in a time perspective, namely what resources and when they will be needed.

3) It should point out the possible bottlenecks, the series of actions which will require longer time and consequently delay the completion of the program.

4) It should estimate the time and cost each action will require for its completion.

5) It should provide for a continuous and effective evaluation of the program's progress during the execution period.

The planning and implementation model presented here intends to respond to the quality requirement stated above. The model has been inspired by the CPM (Critical Path Method) and PERT (Program Evaluation Review Technique). The essential elements of these methods have been retained and adapted to the specific needs of agrarian reform action programs.

CPM (Critical Path Method) had its beginning in 1956 when the Construction Division of E. I. duPont de Nemours became interested in developing a more effective method of planning, scheduling and coordinating new plant construction and in coordination with engineers of the Sperry-Rand Corporation developed a method designated as "Project Planning and Scheduling System" (duPont report No. 6959) which formed the basis of what is now commonly known as CPM (Critical Path Method).

About the same time duPont was working on its method, another parallel method, but of different approach, was developed by the firm Booz-Allen and Hamilton working under the sponsorship of the Special Projects Office, Bureau of Ordinance, U.S. Navy, which method was to be used for management control over contracts for the Fleet Ballistic Missile Program. This method, formerly called "Program Evaluation Research Task" was later changed to

"Program Evaluation and Review Technique" and is commonly known by the short title of PERT. The successful completion of the Polaris Missile development, some two years ahead of anticipated time, is largely credited to the effective application of the PERT system of control.

In its initial development PERT was intended to effect control over many separate contracts involved in a single program. To a large extent these contracts involved research development work and the manufacture of components and parts that had never before been built. For this reason neither time nor cost could be estimated accurately. Cost, in fact, was not a part of PERT initially; later, however the method was revised to include costs resulting in the publication of a standardized method called PERT COST, which has been adopted for control of contract work in research and development programs administered by the Department of Defense and the National Aeronautics and Space Administration (DOD and NASA).

CPM, as distinguished from PERT, may properly be classified as a deterministic rather than a probabilistic program as it is PERT (from the nature of determining the time of occurrence of events). In the full application of CPM both time and cost are controlling variables, and it requires and presumes that both cost and time can be estimated (or determined) with reasonable certainty and accuracy. Furthermore CPM concerns itself principally with "activities" rather than "events" and hence it may be described as "activity orientated", rather than "event orientated" as is PERT.

Of the two systems there seems to be general agreement that for research and development programs, PERT is more applicable, while CPM serves as a more useful purpose and is best suited for construction work and needs

of the construction industry.

The model proceeds through the following steps:

1. The objectives intended to be accomplished by the program are distinctly stated.
2. A clear and specific knowledge of the starting point is acquired.
3. The logical steps of all the actions needed to go from the starting point 2, to the objectives 1, are constructed.
4. Time for the accomplishment of each step is specified.
5. Cost of accomplishing each step is also specified.
6. Needed resources for the fulfillment of the entire program are assessed.
7. A periodical review of the progress of the program is done once the program is under way and the preceding steps have been taken.

Now a more detailed exposition of each step will be presented.

Step 1) Statement of objectives: Oftentimes agrarian reform objectives are expressed in a retorical and vague way by politicians mainly interested in capturing the imagination of the people. However, if effective planning is wanted, the objectives have to be clearly and specifically stated in a clear-cut and nonambiguous way.

The determination of the objectives can be made at any level provided it can be done clearly and precisely. For example, at a national level, one objective could be to divide the whole country into agrarian reform zones on geographical and ecological basis. At a local level the objective could be to expropriate farm "A" and distribute the land among "X" number of farmers.

An agrarian reform is a sum of a number of partial objectives at different levels. Some objectives are to be attained before others can be attained. Some are of vital importance while others are only secondary.

Therefore, a priority list of objectives has to be developed and work should start with the top priority ones assuming as it is the normal case, that there are limited resources available for the agrarian reform implementation.

Step 2) Clear and specific knowledge of the starting point: Once an objective has been specifically stated it becomes the target or end-in-view of the project. No useful planning, however, can be done until the departure point is well known. If, for instance, the objective is the redistribution of the land in zone B, the actual land distribution, the region land resources, the population numbers, qualification and needs, the legal statutes of the land and water rights, etc. have to be known. The first part of the planning will be, therefore, to find out how much do we know of these basic facts. From the actual situation as it is now known the planning steps will start.

Step 3) Construction of the logic steps of all actions needed to go from the starting point (actual knowledge) to the objective: The target has been established as well as the departure point on the basis of the existing knowledge of the reality. The model requires now the construction of a complete network of steps or actions necessary to go from the actual situation to the objective. The steps have to be set in logical order.

The essential qualities of the network construction are:

1) strict logic in the ordering of the steps, 2) complete breakdown of actions, avoiding aggregates of actions in a single step, and 3) no action to be omitted.

Let the thought be clarified with an example:

First, refer to strict logic in the ordering of steps. Before land can be distributed, land must be acquired and its production potential assessed, the necessary legal steps have to be taken and the land has to be valued.

Second, refer to the complete breakdown of actions. Contract personnel for implementing an agrarian reform project is an aggregate of actions. The personnel to be contracted has to be specified in every category. It might also happen that not everyone has to be contracted at the same time, nor will it take the same time to find personnel of each category. The breakdown demands, therefore, to put the general statement into specific actions, as for example, contract two agronomists, contract a secretary, etc.

Third, refer to no action can be omitted. For instance, if a legal investigation is omitted, or a financial arrangement is omitted, the network will be incomplete. Then the necessary arrangements for the omitted actions will not be made and the whole program will be in fault because of these actions that were overlooked.

The network will normally have parallel lines, namely a group of actions that can be accomplished concurrently in time.

Often the same things can be accomplished in different ways and consequently alternatives are opened in the planning. In action planning the most obvious alternatives, at least, should be considered to allow flexibility in the distribution of the use of the scarce resources. The decision as to what alternative is taken will come after all groups of action that can and have to be accomplished concurrently in time are established. Then it is possible to find the alternatives which can make the best use of

the scarce resources.

Step 4) Time evaluation: Once the network of actions or activities has been completed, and graphically represented, the time required for the completion of each action has to be estimated. Obviously, the estimates will not be easy in many instances due to the lack of previous experience and the many psychological perturbing factors often involved in the action implementation.

The procedure used to obtain estimates of the activity time (t) and the variance of the activity time ($\sigma^2 t$) is through interrogating the personnel involved at each action. Ideally, from them a probability density function should be obtained. In fact, however, a distribution approximated by three parameters is the most that can be expected. The three parameters are:

1. The most likely time necessary to complete the action.
2. An optimistic activity time.
3. A pessimistic activity time.

The estimated t and $\sigma^2 t$ have been given by Malcolm, Roseboom, Clark and Fazar (20) as:

$$1. \quad t = \frac{1}{3} [2m + \frac{1}{2}(a + b)] \quad \text{and}$$

$$2. \quad \sigma^2 t = [\frac{1}{6}(a - b)]^2$$

where: m = most likely activity time; a = pessimistic activity time; and b = optimistic activity time.

Equation 1 can be put in a more simplified way as follows:

$$t = \frac{a + 4m + b}{6} \quad .$$

The meaning of the equation is now easier to understand. What it has done in reality is to give different weights to the different parameters. The most likely time is given 4 times more weight than each of the extremes because it is supposed that the distribution approaches the normal curve.

The total time needed for the completion of the program is the sum of the time required for the completion of each action in the longest time requiring series of actions. The Critical Path is the series of actions which require the longest time for its completion.

To clarify what has been said a simplified example is demonstrated in the Critical Path diagram, Figure 9.

The encircled numbers are called events, while the connecting lines from an event to another or from one encircled number to another are called activities. The numbers above the connecting lines represent the time in months to complete the activity.

In the example there is an independent event 5, all others start with event 0. This could represent an action that can start or has already started independently of the actual program but it is needed for the completion of the actual program. The calculation of the time for each series of events and activities is done separately from the starting event. The highest addition shows the total time needed for the completion of the program and indicates at the same time where the Critical Path is.

Therefore, there are four series of actions: three starting from event 0, and one starting from event 5.

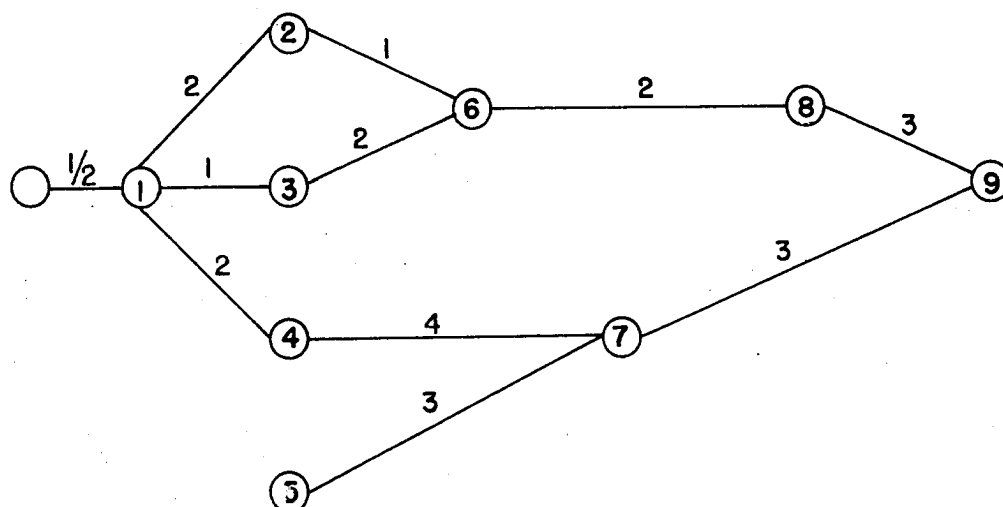


FIGURE 9. A. LOGICAL CONNECTIONS

(a)	(b)	(c)	(d)
0 to 1, $\frac{1}{2}$ mo.	0 to 1, $\frac{1}{2}$ mo.	0 to 1, $\frac{1}{2}$ mo.	5 to 7, 3 mo.
1 to 2, 2 mo.	1 to 3, 1 mo.	1 to 4, 2 mo.	7 to 9, 3 mo.
2 to 6, 1 mo.	3 to 6, 2 mo.	4 to 7, 4 mo.	
6 to 8, 2 mo.	6 to 8, 2 mo.	7 to 9, 3 mo.	
8 to 9, <u>3 mo.</u>	8 to 9, <u>3 mo.</u>	_____	_____
Total $8\frac{1}{2}$ mo.	$8\frac{1}{2}$ mo.	$9\frac{1}{2}$ mo.	6 mo.

Series (c) is the one that requires more time for its completion and consequently is the series that determines the total time of the project and the Critical Path. If the time could be shortened one month, there would be no Critical Path and no delays. The series (d) can start, if it is convenient, three months and a half later than the program. Series (a) and (b) can be delayed one month at the most convenient stage after event one.

In the Critical Path Series the time can often be shortened by using more factors, unless, of course, the delay is due to some intrinsic reason impossible to alter, for instance a 60 day period given to the landlords by the Law between the announcement of expropriation and the expropriation itself.

Whenever the time reduction is possible the choice will be between the time saved and the cost of saving this time. The cost has to be considered, however, in the context of the entire program not in the time reduction effort only. It is quite possible that the time reduction could save a substantial amount of money in the other series, avoiding delays and being able to make a full use of the resources involved in the Program.

Once the time has been determined for each action or activity, there is a more practical and useful way of presenting the graph namely in a time dimension as shown in the Critical Path diagram, Figure 10.

Every activity is represented with the length of the time required. The horizontal measure bar can express not only time in abstract but the specific time starting from the first day of the Program, say July 15 or August 1.

Step 5) Cost evaluation: The cost evaluation can be done the same way as the time evaluation. The variables relevant to the cost are the time each activity will need, the resources involved in each activity, and the prices of the resources to be used. Double counting has to be avoided when some resources contribute to several activities at the same time.

Step 6) Resources evaluation: It is not difficult to get a list of resource requirements in a time sequence revising the Program after the time requirements have been established and the cost estimated. Now the policy maker and the Program implementors have a clear picture of the Program or Project requirements in terms of resources, time and money. They now see the complexity of the Project and consequently they can plan the adequate strategies for securing the resources, for avoiding the unnecessary delays and bottlenecks, or, at least they can plan ahead for the use of the resources in something else during the slack periods. Further, the policy makers are now able to coordinate the Project with other projects.

Incidentally, the Model could be of great help in preparing the yearly budgets, showing clearly to the legislators for what purposes the money is asked, how waste of resources is avoided, and what the consequences would

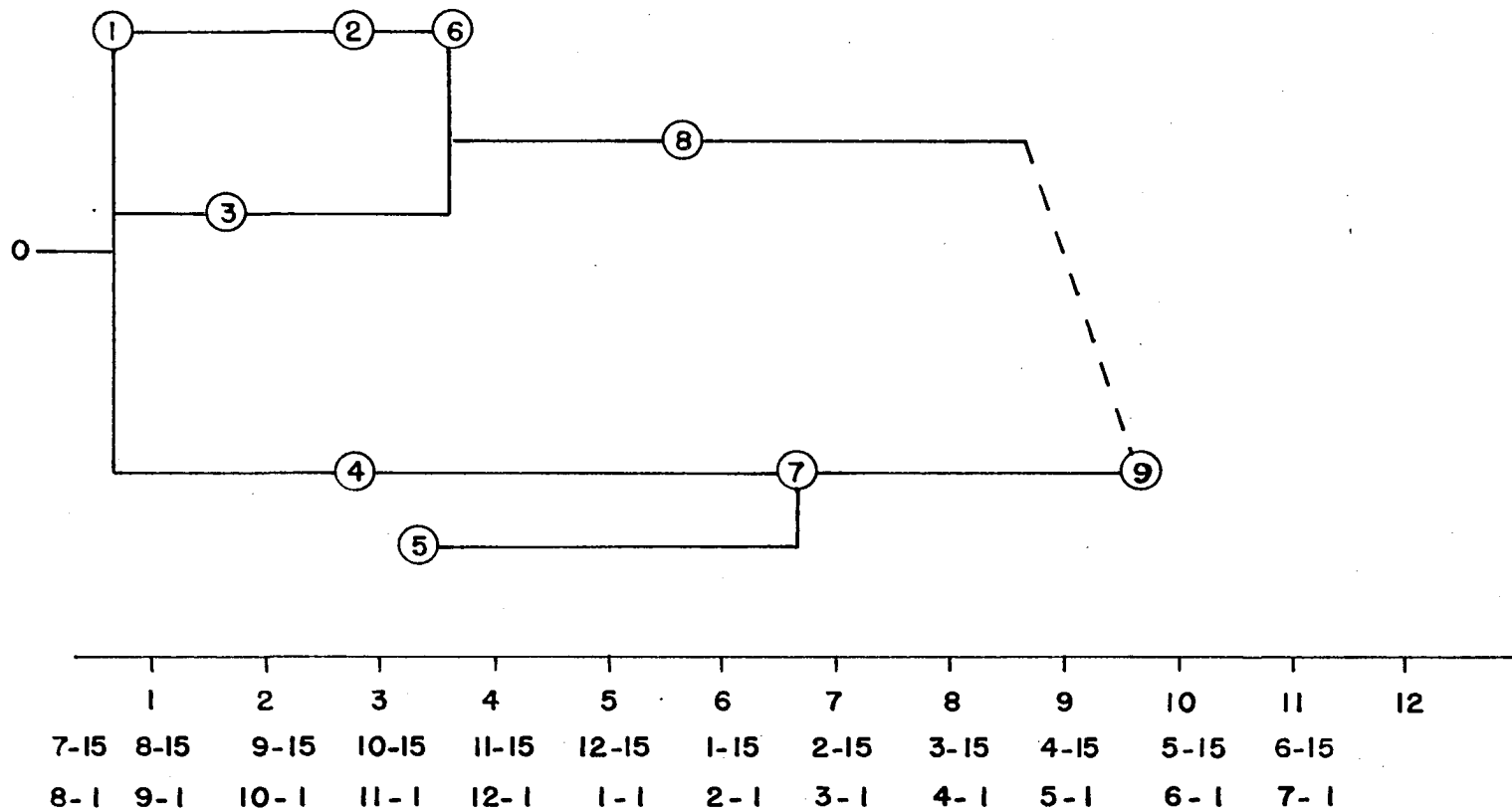


FIGURE 10. B. LOGICAL CONNECTIONS AND TIME DIMENSION

be in the different projects if there is a budget cut at any specified level.

Step 7) Progress review: The diagram of Figure 10 helps to make a periodic examination of the work accomplished and to detect delays or advances over the plans as well as other anomalies. This progress review will allow the personnel responsible for executing the program to make the necessary adjustments to avoid waste of resources and time delays.

After the examination, a green sign over the activity line would indicate that the project proceeds according to plans; a red sign would indicate that there are delays in the activity performance. A blue sign would indicate that the activity is proceeding at a faster speed than the one estimated in the plan, and finally an amber sign would indicate that something is not proceeding well, although a clear diagnosis cannot be made with the available knowledge and, therefore, further investigation is required.¹

A practical application of the Model will be presented in the next chapter in connection with the Central Sierra agrarian reform project. Three programs were planned under the guidelines of the Planning Model just presented. The success was very limited due to the fact that only one of the programs got into the implementation stage and even this one suffered fundamental changes shortly after it started and the essential steps of the Model were neglected. The failure, however, could not be attributed to the Model itself but rather to the unstable attitude of the policy makers toward the use of the Model. The lesson is that a successful application of the Model requires the conviction, the stable support and the personal involvement of the policy makers.

¹The selection of colors is arbitrary, although here it has been tried to follow the conventional color use in other purposes.

V. THE APPLICATION OF THE MODELS TO THE 1964 AGRARIAN REFORM LAW IN THE CENTRAL SIERRA

The need for an agrarian reform in Peru became obvious through identification of the problems in the first and second chapters of the present study. The Peruvian Agrarian Reform Law clearly states that one of the principal ends-in-view of the agrarian reform is economic development of the country. It was pointed out that economic development through agrarian reform would be attained if adequate new structures were established. In Chapter III the targets and the structures to achieve the targets were identified. In Chapter IV an implementation model was presented which is expected to help in the critical stage of carrying on the agrarian reform.

In the present chapter the Central Sierra area will be analyzed in terms of the accomplishments achieved through the agrarian reform process which is taking place. The efficiency and action planning models will be the yardsticks to measure the failure and success elements and will prepare the way for the final chapter in which recommendations will be made. The hypotheses proposed in Chapter II will be also tested in this chapter through the use of the models as means.

A. Nature of the Agrarian Reform and Its Application to the Central Sierra

Early in 1962, land invasions took place in the Central Sierra. The Army was called to the scene and some invading farmers were killed. The National Council of Agrarian Reform had emergency meetings on March 10, 14 and 20, 1962, where it was decided to initiate a study of the area to

ascertain the causes of the unrest. The study was done by agrarian reform personnel in April and May, 1962, using available data of official sources, like the Community Census and the Demographic Census, and completing the data with field observations on 62 Comunidades and 27 haciendas of the Pasco-Junin area. The data collected in the study were not very accurate as further studies and analysis have proved. It did however, give some idea of the real situation.

In August, 1963, agrarian reform personnel were sent to the Central Sierra and in November the Central Sierra Agrarian Reform Project was created and the headquarters of the Project established in Tarma. One of the first jobs the agrarian reform directors decided should be done was to gather data from the Comunidades and haciendas of the area in view of redistribution of 78,417 has. of haciendas' land in fulfillment of the Supreme Decree No. 11, of August 9, 1963, and later in view of the acquisition and distribution of the Algolan haciendas consisting of 309,000 hectares. The data collected from the haciendas were almost exclusively for land, buildings and cattle appraisal. The data from the Comunidades were of more detailed and comprehensive nature and was collected starting with the Comunidades neighboring Algolan.

The farmers were not too reluctant to answer the questions, though the accuracy of the answers depended a good deal on the ability of the questioning personnel. These personnel were agronomists, veterinarians and social assistants helped by auxiliary personnel. All were living in the area, strategically located in different Comunidades. However, they had no special training apart from a few lectures on the meaning of the question-

naire and what was intended with it and how they should ask the questions. The questionnaires once filled out by the agrarian reform personnel on the post, were sent to Tarma where more specialized personnel revised and codified the answers. In some cases it was necessary to repeat the survey because of the inconsistencies of the data.

The quality of the data has been improving over time, especially since the moment that the Department of Economics of the Central Sierra Agrarian Reform Institute had its own personnel trained for data collecting. It is obvious, therefore, that the reliability of the data is uneven. The less reliable data are the ones referring to the family income. For instance, the income gained by members of the family working outside agriculture were normally not recorded. Families engaged in nonagricultural activities normally declared a much lower income than they actually received. A better approximation was obtained for the farm income, especially livestock income, because the number of sheep and cattle could be checked on the spot and on this basis the income given in the answer could be checked.

Once the questionnaires of a Comunidad had arrived in the Department of Economics of the central office in Tarma and were checked, all data were put together and averages calculated. The families were stratified in 9 groups, taking as a base the occupation of the head of the family and of the other members of the family. The eight first strata referred to families having to do with agriculture and only the ninth strata referred to families who did not work in agricultural activities.

After the data were codified and averages taken, a report was written for each Comunidad giving for each of the nine strata the total net income, the number of families, the number of individuals, the mean family income

and the mean per capita income. Finally, and overall average for the whole Comunidad was given for the preceding items. The report presented also a detailed analysis of the population, including number of individuals per family, number of children per family, marital status, age and sex distribution of the population pyramid, active population (who actually were working) and outlook for the future needs of the Comunidades' population. The report presented also the cultural situation of the Comunidad, number and percentage of illiteracy. There are also in the report comments on the economic situation of each strata on the basis of the net income data, and on the basis of the livestock number and distribution. The report ends with a study of the productivity of the total estimated invested capital in the agricultural activities in the Comunidad.

It has not been possible so far to establish exactly the number of hectares each Comunidad has, it seems that not even the comunidad leaders know it for sure. We have been working with approximate numbers. That lack of knowledge is not surprising in the conditions of the Central Sierra because the Comunidad land titles, when they exist, do not give acreage but point the limits of the Comunidad land, limits that often are difficult to identify. A cadastral survey of the Comunidad lands has never been made. Even many of the haciendas do not have accurate acreage figures. Algolan had a cadastral survey of the haciendas and it was bought by the Agrarian Reform Institute for two and a half million soles, considering that the price was low. According to the Agrarian Reform Institute, the estimated cost of making this cadastral survey of Algolan in 1964 would have been 6,580,052.06 soles. It is understandable then that the Comunidades never

had cadastral surveys taken and that even now the Agrarian Reform Institute is reluctant to expend much money in making them. Often the cadastral survey is more expensive than the price of the land itself.

The main purpose of the establishment of the Central Sierra project was to implement Decree No. 11 already mentioned. This Decree was issued after new land invasions took place in the Central Sierra. It intended to expropriate all the hacienda land which had been invaded by the Indians of the Comunidades in the Pasco and Junin Departments and to distribute the expropriated land among the neighboring Indian Communities. It was clear, however, that this limited action would not suffice to calm down the spirits; consequently it was expected that the Central Sierra agrarian reform project would continue and expand. Two specific reasons supported this expectation: the advanced stage that the debate of the agrarian reform bill had reached in the Camera and in the Senate and the imminent purchase of the Algolan haciendas by the Peruvian government for agrarian reform purposes. The Fernandini family, owners of Algolan haciendas, agreed to sell the 309,000 has., located most of them in Pasco Department, to the Government. Under Decree No. 11 a part of Algolan was to be expropriated, however, the Algolan owners preferred to sell the entire property. The actual purchase of Algolan took place in March, 1964, only a month and a half before the Agrarian Reform Bill was passed in the Camera and signed by the President. The transaction, though criticized by the opposition, was a wise step to speed agrarian reform because there was no complete assurance that the Law would pass so soon, and even in the eventuality of the immediate passage of the law, a delay in its application was foreseeable because the writing

of the regulations, the approval of land valuation methods and other technicalities would necessarily require time. If then the agrarian reform leaders wanted to start right away, the Algolan purchase offered them a very good opportunity. The form of payment for the land was decided would be done according to the provisions that the Agrarian Reform Law would establish. Installations and livestock were paid for in cash. The purchase of good livestock and good installations was an advantage for the execution of an agrarian reform that would go further than the mere redistribution of land.

Although the 1962 and 1963 land invasions had some political overtones and represented the old vindicating spirit of the Comunidades over the land that the Comunidades claim was taken from them in the past, land invasions were also an effect of the need the Comunidades felt for more land. Land in the eyes of the rural population is not only a means of production and a source of income, but also a means for power and prestige. In the case of the Central Sierra, however, land was very strongly looked upon by many of the Comunidades as an economic need. In the specific circumstances of the Comunidades a larger extension of land seemed the only practical road of survival. The reason was clear; the increasing population of the Comunidades and its consequent increase in food needs were met by an increased number of sheep. Land, however, remained fixed. The pressure of sheep on the land was destroying the pasture and increasing the problem. New land on which to put the sheep seemed an absolute need to the Comunidad people.

The agrarian reform directors who used the 1962 study also put the emphasis on the land factor as the first step toward a solution of the

Central Sierra problems. In 1964, it was written "The studies conducted (in the Central Sierra) demonstrate that the agricultural revenue of the majority of the Comunidades, is positively related to the land/family ratio" (15, p. 52).

The statistical evidence of the 1962 data and the collected data subsequently do not, however, support this positive correlation; rather they question it very strongly.¹

How could this apparent contradiction be solved? It can be demonstrated that at least some Comunidades need more land but at the same time it can also be demonstrated that land is not the main solution and it can even be no solution at all, if nothing else is changed. This is in fact the first hypothesis (Chapter II, C, 3) which stated "a) Agrarian Reform conceived as mere land redistribution is not going to solve the problem of the agricultural sector in the Central Sierra". This hypothesis is going to be tested now.

If the quoted statement of the agrarian reform directors would have been accurate, the correlation between the average acreage of pasture land per family in each Comunidad and the average gross revenue from livestock per farm family also in each Comunidad, should have been high and positive. That was not so. Correlating these two terms in 25 Comunidades of the Pasco Department for which reliable data were available² it was found a coefficient

¹The author does not want to imply that the Agrarian Reform Directors' statement was contrary to the evidence they had at the moment of formulating it. They probably based the statement on a statistical error.

²The number of families was a weighted number; families full time occupied in livestock operations equalled one; families with primary occupation in livestock but with a secondary occupation in something different, equalled 0.75; families with livestock as only secondary occupation, equalled 0.50.

of correlation of .149816 with a standard deviation of $S_x=126.2974$ for the acreage per family, ($\bar{x} = 105.9392$) and $S_x=1,903.5389$ for gross revenue per farm family ($\bar{Y}=2,777.5184$). On this evidence it can be concluded that the correlation is not significant.

More surprising than the latter result was the outcome of correlating total pasture land acreage and total livestock revenue in ten Comunidades of Pasco (using the 1962 data), the result was a negative correlation coefficient of $-.78$. This would mean that, *ceteris paribus*, an increase in acreage would decrease the total gross revenue. The selection of the ten Comunidades was done on the basis of proximity to Algolan haciendas. Taking a broader base and using more reliable data (1964 Central Sierra Agrarian Reform Project), in fact, taking the same 25 Comunidades of the first correlation reported here, the acreage of these 25 Comunidades was correlated with their gross agricultural income and the result was a coefficient of correlation positive but low $.357265$, with a standard deviation $S_x=7,422.5982$ for the acreage ($\bar{x}=6,779.16$) and $S_x=343,169.41$ for the gross income ($\bar{Y}=312,006.48$).

In order to test these results another correlation was run taking 36 Comunidades and including all land, pasture and crop¹, and the total agricultural revenue (gross). Here the result was a positive and high correlation. The coefficient of correlation was $.917533$, but there were significant exceptions or points dispersed from the correlation line. The standard deviation for the acreage was $S_x=57,442.7713$ ($\bar{x}=33,975.3611$) and for the gross revenue $S_y=1,227,063.122$ ($\bar{Y}=895,467.61$).

¹Crop land was transformed into pasture land equivalents by multiplying number of crop hectares by 15 (coefficient found and used by agrarian reform technicians in the Central Sierra). No other allowances were made for eventual crop or pasture land quality differences for lack of information.

These facts taken by themselves would certainly tend to discourage an agrarian reform in the area based on land redistribution exclusively.

What is the reason for these unexpected results? In the search for an answer the problem can be approached from another point of view: namely, the land productivity differences among Comunidades. In the gross productivity of the pasture land of the 25 Comunidades mentioned before, (the result of dividing the total gross revenue from livestock by the number of hectares of pasture land in each Comunidad) a variation is found that goes from S/ 179.27 to S/ 4.80. What is the reason of such variation? Would it be the different quality of the pasture land? The answer appears to be negative. According to the soil specialists of the Central Sierra Agrarian Reform Institute the pasture land and the pasture itself of the Comunidades does not differ significantly, and certainly not so much as to give an adequate explanation for the differences. A closer examination of the productivity differences discloses interesting facts. Vilcabamba is the Comunidad with the highest productivity S/ 179.28 per hectare. The following Comunidad has only a productivity of 79.02 soles per ha. This fact places Vilcabamba well ahead and in a unique situation with reference to the other Comunidades in the area. There is no available clear cut explanation for this fact; it could however be that Vilcabamba had rented or invaded land, (the calculation was done on the basis of the Comunidad acreage). This explanation is supported by the fact that Vilcabamba has an average of 10.53 head of sheep per hectare (pasture land in the Sierra can adequately support only one head of sheep per hectare on the average). Further support for the hypothesis that Vilcabamba has more land than the acreage officially recorded is that an explanation for the high

productivity could not be found in the quality of sheep. Vilcabamba sheep were classified by the 1962 census as of poor quality, producing only 1.9 pounds average of wool per sheared sheep and 11 kilos average of meat per year per slaughtered sheep. The only explanation left is the high number of sheep per hectare or the fact that more hectares than the officially calculated area were available to Vilcabamba.

There is a high negative correlation between the productivity of the land (pasture land) and the average acreage per farm family; therefore, the more land is available per farm family the lower is the productivity of the land. Population pressure on land seems therefore to give an explanation of the productivity differences. Next question is, of course, how the differences are obtained. It seems that there are no substantial differences in the technical levels, sheep quality, farmers' skills and farmers' organizations which can effect land productivity. The differences are obtained through intensive use of the factors with the same techniques. This can be demonstrated by the data available. The Comunidades with a higher pasture land productivity have also, with very few exceptions, the larger number of head of sheep per hectare, have also higher percentage of sheared sheep and animals slaughtered. What that means in fact is that the intensive practices are of a disinvestment type. The overgrazing of pastures is very apparent in the Comunidad land in the Central Sierra. This was in fact one of the main reasons that pushed Comunidades to invade hacienda land. The Comunidad land in many cases could no longer support the high number of sheep. The reduction of the flock, unless it is replaced, will be reflected in the next year's gross revenue of the Comunidad.

It is clear, that a sound productivity increase cannot be based on disinvestment practices. Comunidades of high pasture land productivity could continue obtaining the same results without destroying the land by improving the sheep breed, reducing sheep diseases and mortality. Of course this presupposes the improved breeds and the better techniques are available, the capital to pay for them is available and the expected results and prices make the investment attractive.

It will be clear by now why Comunidades with a low ratio of pasture land per farming family and a consequent high ratio of head of sheep per hectare, urgently wanted more land. For them pasture land is a substitute for intensive practices that are destroying their pasture, or an absolute necessity because the pasture is already deteriorated. If nothing else is changed however, more pasture land would not mean in itself an increase in income insofar as pasture land substitutes for intensive practices; it would certainly mean a higher production potential over time because pasture land would be better conserved.

Looking at the crop land we find also a high and increasingly negative correlation between the gross average productivity per hectare of crop land and the ratio of average hectares of land per farming family. This fact suggests again the hypothesis that land scarcity, or the pressure of people on land, stimulates a greater albeit temporary productivity.

Central Sierra data (24) reveal another interesting fact which seems to indicate that pressure of people in the families determine the level of agricultural production of the family. Taking the average yearly family and per capita net income of the exclusively farm families, a higher range

of variation is found among family income than among per capita income. The test is made in the two regions already mentioned in this study of the Department of Pasco; Yanahuanca and La Quinua. In Yanahuanca, the range for the average family net income of 12 Comunidades is 2,821 soles (from 705 to 3,526 soles variation) or an absolute dispersion of $s=800$ soles and a relative dispersion $\frac{s}{\bar{x}}$ of 0.4; while the range for the average per capita net income in the same 12 Comunidades and for the same group is only 352 soles (from 327 to 675) or an absolute dispersion of $s=113$ and a relative dispersion of $\frac{s}{\bar{x}}$ 0.21. In La Quinua region the range for average family net income of 18 Comunidades is 7,746 soles (from 1,692 to 9,438 soles), or an absolute dispersion of $s=2,000$ and a relative dispersion of $\frac{s}{\bar{x}}=0.42$; while the range of the average per capita net income is only 2,305 (from 354 to 2,659 or an absolute of $s=800$ and a relative dispersion of $\frac{s}{\bar{x}}=0.48$). This fact suggests the typical pattern of subsistence farming, very clear in the poorer region which is Yanahuanca, where the population needs commands production. In a few Comunidades a correlation was made between the net income of the families and the number of children, the correlation was positive and high, confirming the fact just presented.

The average net income of the exclusively farm family group¹ in 30 Comunidades in Pasco is consistently lower than the net income of any other groups. This finding confirms the studies made elsewhere of income differences in the agrarian sector with respect to other sectors (4).

¹Combining the nine strata presented before into four, on the basis of the principal and secondary occupation of the head of the family (first strata: principal and secondary occupation is farming; second strata: principal occupation farming but secondary elsewhere; third, principal occupation not farming, secondary farming; fourth, no farming occupation). The results show that the income of the first group is always lower than the income of any other group, and so it is for the second in respect to the third and fourth; and so also (but with many exemptions probably due to unrecorded data in the fourth strata), with the third group with respect to the fourth. See Table 6, page 49.

B. Use of the Efficiency Model to Test the Structures

The main reason why agrarian reform conceived and implemented as mere land redistribution is not going to solve the economic problems of the Central Sierra (the ones presented in Chapter II) is that mere land redistribution does not improve in itself the economic conditions of the farm population as it has been shown in A of this Chapter. The psychological good effects that the farmers might experience in receiving a piece of land will not last long nor will be satisfying enough if it is not accompanied with an improvement in their level of living. This of course does not mean that land should not be redistributed. It only means that land redistribution has to be accompanied with other complementary actions which could secure economic betterment. Which complementary actions should they be, and how should they be implemented will be dictated by the economic development goal of the agrarian reform. From this, the second hypothesis stated in Chapter II, C, 3, namely b) "Agrarian reform if it is to help in any significant way to solve the problems of the Central Sierra has to be conceived primarily as an instrument for economic development of the area and the nation" follows as a logic consequence.

It has been seen that the Agrarian Reform Law of Peru is in accord with this hypothesis and with the hypothesis discussed in A of this Chapter. The problem, therefore, is not in the theoretical level but rather in the practical level of how to make agrarian reform a successful instrument for the economic development. Here the third hypothesis stated in this study (Chapter II, C, 4) has its place. This third c) hypothesis

states that "Agrarian reform will be a successful instrument to bring about economic development insofar as the new structures thus created are carefully selected and adequately constructed. An efficiency model can help to test the structures as to their adequacy to contribute to the economic development goal".

The model was presented in Chapter III and will be now used to test the structures that the agrarian reform process is creating in the Central Sierra.

The model stated that first the economic objectives have to be determined. The objectives established in Chapter III as targets for the Central Sierra agricultural sector were: A) Increase of agricultural production, B) Increase of the efficiency of the production factors, and C) Transfers of production factors within the agricultural sector and to other sectors of the economy consistent with the needs of the agricultural sector and the other sectors, in other words, consistent with the needs of the general economic development of the country.

It was assumed in Chapter III that these objectives constitute the main contribution that the agricultural sector of the Central Sierra can make to the development of Peru and at the same time the main contribution to the development of the agricultural sector of the Central Sierra itself.

Once the objectives are determined the model postulates the establishment of the instruments to attain the objectives or targets. The four key agrarian structures presented as instruments in Chapter III to attain the targets were a) Land tenure arrangements, b) Marketing facilities, c) Credit facilities, d) Technical assistance and education facilities;

A diagrammatic presentation of the model under discussion and the implementation model of Chapter IV, applied to the Central Sierra objectives and instruments is presented in Figure 11.

As will be seen, the objectives and the instruments mentioned are in general terms adopted in the Central Sierra, though the lack of specification and consistency in the establishment of the targets and in the instruments, together with the hesitance in the different steps to be taken is jeopardizing somehow the entire agrarian reform process. From the very beginning the Central Sierra Agrarian Reform directors felt the need of creating new land structures, of giving technical aid and education to the farmers and of facilitating credit as well as doing something to improve the market system.

It will be seen and analyzed now what has been done in the Central Sierra in the establishment of the mentioned structures and what else seems should be done in each of these key structures consistent with the attainment of the targets.

The procedure for the analysis of each structure will adhere to the following pattern. First, the general problems related to the establishment of the structure in the specific circumstances of the Central Sierra will be presented. Secondly, the solution given by the Agrarian Reform Institute¹ will be shown. Thirdly, the advantages of the solution given by the Agrarian Reform Institute will be considered. Fourthly, the problems of the Agrarian Reform Institute's solution will be presented. Fifthly, other

¹The Agrarian Reform Institute title is used for the sake of simplicity. As it was said in Chapter I, D, the Institute has had two official titles, IRAC up to the time the Agrarian Reform Law was signed and ONRA afterwards.

T A R G E T S

I N S

- A) Increase agricultural production
- B) Increase the efficiency of the production factors
- C) Transfer production factors, specially manpower, intra-sectorally and extra-sectorally, according to the different sectors needs and consistent with a balanced national development

- a) Land tenure arrangements
- b) Marketing facilities
- c) Credit facilities
- d) Technical assistance

AGRARIAN REFORM → acquisition of land and water rights →

distribution of land

Old land tenure structures canceled

New land tenure structures established



SUPPORTING ACTION TO ATTAIN THE TARGETS

land tenure arrangements

Implemented with the help of a CRITICAL PATH METHOD

for the best use of resources
for time saving
for provision and adoption

Figure 11 Application of the Efficiency and Implementation Models to the Central Sic

I N S T R U M E N T S

- a) Land tenure arrangements
- b) Marketing facilities
- c) Credit facilities
- d) Technical assistance and education facilities

distribution of land → *PRODUCTION*

*New land tenure structures
established*

*Income increase
income distribution
farmers economic betterment*



land tenure arrangements



*marketing facilities
credit facilities
technical assistance
education facilities*

*for the best use of resources
for time saving
for provision and adoption of right policies*

solutions, or corrections to the solution given, will be suggested.

The criteria in accord with the postulates of the model, for the third, fourth and fifth points are the degree the structure seems able to help to the attainment of the targets.

Land tenure structure: There is always a great concern about the effects of the agrarian reform on the agricultural production. Some sad experiences have shown that after an agrarian reform, production has decreased substantially (for instance in Bolivia after the 1952 agrarian reform). Reasons for this concern do exist. Some of the expropriated land in the Central Sierra had been efficiently cultivated before expropriation took place. Would this efficiency be maintained by the new farmers? If not, production will necessarily decline. The haciendas were producing (at least some of them) an agricultural production surplus which was sent to the cities. Will the new farmers use for themselves this agricultural production surplus? If they do, the production available for the non farm population will diminish substantially.

It is therefore a problem of maintaining efficiency, and a problem of avoiding the agricultural sector to become largely a subsistence farming operation.

The solution of the two problems is, though not exclusively, a function of the new land tenure structures. To find out the adequate solution of the two problems an analysis of the success elements determining the efficiency of the haciendas and the failure elements determining subsistence farming has to be made.

In general terms the success elements of the efficient haciendas con-

sist of an adequate size of the operation, the technical and managerial skills available to them, and a relatively high technical level of operation and organization and the incentive to produce. In general terms also the failure elements of the subsistence farming is the small size of the operation, the lack of technical and managerial skills (or the lack of opportunity of using any technical and managerial skill) and a low technical level of operation and organization and little incentive to produce more than needed for direct family consumption.

The contribution of the land tenure structure to maintain (or substitute for better ones) the success elements of the hacienda, and avoid the failure elements of the subsistence farming could be very important.

First, the new structure could provide adequate farm size. Adequate farm size, however, cannot be defined in absolute terms because there is never an absolute optimum farm size. There is a substitution ratio between acreage and other elements, like special cultivation techniques, seeds and livestock quality and so on, that defines isoproduction lines at different acreage levels. The economics of scale of the large operations can also be substituted, at least in some important aspects, for technical agencies financed by a group of farmers (substituting for haciendas technicians), by production cooperatives substituting for multiplied managerial ability required for the operation of each small farm, and by marketing cooperatives for bargaining position that a large operation can have in the market, etc. Up to a point, therefore, size of farms can be made a function of other requirements like need of accommodating the larger possible number of farmers. More will be said about this point when the Agrarian Reform Institute solution

for the Central Sierra is discussed later.

Second, the new structure could provide the stimulus for development of managerial skills and entrepreneurship ability. For these two things to develop security of tenancy and avoidance of rigidities in the structure that could put a ceiling to the farmers income and aspirations are needed.

The land tenure structure does not in itself resolve the problem of improving the technical level of production but can provide the stimulus for seeking new techniques and applying them when the land tenure structure gives security and does not put a limit on the farmer's aspirations.

The incentive to produce depends largely on the input output prices and consequently on the market organization. The land tenure structure, however, can provide the farmers with the opportunity to enter the market with favorable terms.

The specific problems of the Central Sierra in connection with the land structure are 1) the type of agriculture operation (especially livestock) which must be by physical necessity of an extensive type, 2) the existence of an special institution, the Comunidad, 3) the excess number of farm people in the area with regard to the available land and the relatively few opportunities that exist for these people to work elsewhere.

The solution presented by the Agrarian Reform Institute has been to create agrarian structures in the form of communal enterprises consisting of a minimum amount of land (in the case of livestock which is the only type of enterprise created so far by the Agrarian Reform Institute) capable of supporting 5,000 sheep units equivalent, (from 5,000 to 7,000 heads of sheep). The ownership title to the land and to the livestock (purchased

by the Comunidad on credit) will be given to the Comunidad. The Comunidad appoints a 6-man board of administrators. (Junta de administracion) and an administrator. The Board of Administrators appoints the personnel who will run the communal enterprises as paid workers and employees. While the Comunidad has not paid in its entirety for the land and the sheep, the title is not given to the Comunidad. During the interim, the Agrarian Reform Institute exerts a tight control over the enterprise. The former farm workers of the haciendas are also receiving the same enterprises when they group themselves together to form special production cooperatives.

When the Agrarian Reform Institute started taking data family by family in the Comunidades it looked like the land distribution would be made to the families or individuals and not to the Comunidad as a whole; if they had thought in terms of giving the land to the Comunidad it seems there would not have been necessary the long work of collecting family and individual information, because general data for the whole Comunidad would have sufficed. It has been to the Comunidad however, that the land is being given. All the available land through expropriations will be divided among the Comunidades (on the basis of the total population and the land they previously had) and among the former farm workers of the haciendas.

The advantages of the new land tenure structure viewed from the point of view of the targets (namely to increase production and productivity of the production factors and flexibility to allow transfer of production factors when necessary) appears to be present for the transfer of production factors. Manpower will be easily transferred when the opportunity comes because no individual is tied to the land. Capital might also be easily transferred in case of communal enterprises because the communal enterprise

is not the only source of income for the Comunidad and therefore the income obtained from the communal enterprise can be used where it might seem more convenient. Of course, this is not true for the cooperative enterprises of the former farm workers; for them the enterprise will be the only source of income.

In terms of the increases of production and productivity, is not too clear that these targets will be obtained by the enterprises. Two points have to be considered. One is the size of the enterprise (minimum of 5,000 sheep units equivalent); another is the relations between the workers and administrators of the enterprise and the enterprise structures itself.

As far as the size is concerned the problem is not too serious because factor substitutions are possible. There are, however, doubts about the advantages of large size when economies can be made through common veterinarian services and through cooperative services for buying inputs and selling outputs. All of this of course is under the assumption that the land could have been given to individuals in family size farms. On the actual state of affairs it seems the same could have been obtained by keeping the hacienda organization, and distributing the results to the Comunidades without the needs of fabricating the mosaic of enterprises of about 5,000 has. The actual number of people that the communal enterprises will occupy is very small and could be integrated in the former hacienda organization. Technical control and supervision on the part of the Agrarian Reform Institute would have been much easier and the distribution could have been done rapidly and economically. Each Comunidad would have received the title to one or more, or to a part of one of the Algolan haciendas (or other haciendas).

The main problem, however, is not the size, but the relationship created in the new structures which does not seem to stimulate the entrepreneurial spirit of the farmers. This is especially true in the communal enterprises. Those who directly operate them are not the owners in a strict sense, they are paid and the payment is not strictly dependent on their performance. The Comunidad through its leaders controls the operation, but they are well aware that the survival of the Comunidad does not depend on the enterprise. Moreover, the tight control of the Agrarian Reform Institute lessens the sense of responsibility, more so when decisions are made mostly by the Agrarian Reform Institute personnel, especially with reference to the administration and the distribution of the enterprise revenue. In many respects the structure formed for the former farm workers of the hacienda has advantages over the communal enterprise. The workers are the owners of the enterprise and their survival depends on the economic results of the enterprise. State overprotection however, can blur these advantages, especially considering that these farm workers did not have any opportunity to develop their responsibility and initiative under the hacienda structure and if they are not helped to develop it now because the state maintains the same hacienda policy in this respect, little achievement and economic success can be expected from the farm workers in the operation of the farm enterprises. Without the sense of responsibility and spirit of initiative no economic development and achievement can be expected.

Advantages and problems of the Agrarian Reform Institute have been reviewed and a solution of the size problem has been insinuated in the assumption that the land has to be given to the Comunidades. This solution

was to give to the Comunidades the haciendas or part of haciendas, maintaining the former hacienda organization and improving it. This solution might seem a temporary one, and so it is. But any solution is temporary, the circumstances continually change and the economic structures have to change to accommodate themselves to the new circumstances. There is never an end to an agrarian reform as far as adjustments of land tenure structures are concerned. Advanced nations are a vivid example. The size of farm and the farm organization is constantly changing in the USA and so it is in Europe. To transfer the ownership of the haciendas as they are (always with the necessary and convenient improvements) would be the easiest and quickest way of a rapid transformation of the agrarian structure in the Central Sierra. Farming and especially farm land has to be viewed more in the mobility pattern of the industrial sector for example. There is no doubt that immobility and slowness in changes is one of the main reasons to account for the lower income of the agrarian sector with respect to the other sectors of the economy.

The other thing that urgently needs to be corrected is the over-protection of the State. It is true that farmers need help and assistance, but not the kind of pseudo-help that would perpetuate them as minors.

It has been pointed out by Richard W. Patch (26, p. 11) that there is a contradiction in the agrarian reform law between Article 100 "written in the context of a society which enjoys freedom and accepts the responsibility upon which that freedom is based" and Articles 103 and 104 which violate the spirit of article 100. "These two articles (which purport to estab-

lish the duties of the Institute to the persons who purchase land under the reform law and the responsibilities of those persons) are a reversion to traditional government paternalism and "protection" of the purchasers by restriction of their freedom to choose and act". These comments were written in the context of those articles which refer to land acquired by individuals to form family farm units, where as Patch says "the campesinos are to be considered near-wards of the state, with the expectation that they will continue as small farmers, socially immobile, and geographically tied to their plot of land". As mentioned before, the Institute's solution of giving the land to the Comunidad does not tie the individuals to the land, but at the same time the individual attitudes and aspirations of the members of the Comunidad are ignored assuming that they are happy with the ideal of common ownership so often violated "de facto" in the real Comunidades of the Central Sierra. Article 129 of the agrarian reform law consecrates the socialistic or collectivistic ideal of the "socialistic empire of the Incas" as it is called by Louis Baudin (2).

Art. 129 states "The sales of lands to the Comunidades will be with the express condition that in no case can direct ownership be transferred to members of the Comunidad or to third parties. Community members may individually enjoy the use of land in a system compatible with cooperative organization. Pastureland, water, and forest will be for the common use of all and in benefit of the Comunidad and all its members". Does this article of the law correspond to the reality and to the aspirations of the members of the Comunidad? Does it help or can it help the economic development of the Comunidad? How can the Comunidad values be preserved while at

the same time economic development is aggressively pursued? Again it is not in this study the place to solve the problem of the future of the Comunidad as an institution, but it seems appropriate to point out the economic consequences of the policy makers' decisions at the governmental level.

Little research has been done on the attitudes and aspirations of the members of the Comunidades. There is a significant fact observed also in other countries of the similar background, that the economically successful members of the Comunidad tend to abandon the Comunidad and go to live elsewhere. Manning Nash (21, p. 295) observed that "Anybody who begins to orient his activity to economic self-interest begins to detach himself and his family from the local community." Would that mean that the cultural climate and organization of the Comunidad is found inappropriate for personal development? If that could be proved to be so, could it be expected to improve the general economic standard of the Comunidades keeping intact the actual cultural climate and organization? There is no case that we know of where a rural community has made rapid and significant economic progress without a profound cultural and organizational change.

Credit: An agrarian reform conceived as something more than a mere land redistribution, needs to be able to establish the ways and means to supply credit to the new farm owners to buy the right kind of inputs, like improved seeds and animal breeds; to get loans to build or improve installations; to try new technology in the production process, and so on. In the Central Sierra the need to supply credit to the farmers for livestock operations was seen from the beginning and it has been implemented for the acquisition of livestock. In view of the need of good livestock

breeds, especially sheep, the State acquired for the Agrarian Reform Institute the livestock of the Algodan haciendas and it is planning to acquire more from other haciendas.

The livestock of the Comunidades is in general of poor quality and disease ridden; the acquisition therefore of the new lands by the Comunidad, without acquiring at the same time good quality livestock to put on these lands, would decrease the former production level of the land and would certainly not help the economy of the Comunidades.

Money for loans to the small farmers (and to the Comunidades) to allow them to buy livestock has been obtained in Peru from international sources. An expeditious use of this money could permit the Agrarian Reform Institute to acquire more livestock on a rotation basis and rapidly improve the livestock breeds of the Comunidades.

The credit system established in the Central Sierra assumes that the Comunidades as well as the former farm workers of the haciendas do not have the capital to pay for the livestock. The assumption is probably true for the farm workers, but it is not all too certain for the Comunidades. There is evidence of hoarding practices among the farm people of the Comunidades though the extent and amount is not known. If hoarded money exists in the Comunidad, the Comunidad authorities have the means to collect that money from the members of the Comunidad for communal purposes. Theoretically then the Comunidad could pay at least for part of the livestock they would be receiving with the land. In fact, there were in the Central Sierra some instances of Comunidades offering the Agrarian Reform Institute to pay in cash not only for the sheep but also for the land. On

the other hand some Comunidades and most of the former farm workers of the haciendas did not want to expend their own money for the acquisition of livestock because they were afraid that the investment might prove a failure. With this attitude of mind however, not even long term, low interest credit can attract and stimulate investment, very especially if the investment looks risky to the farmer. On these premises it can be said that the problem of credit in conditions of backwardness is not so much the lack of capital (it is of course) but rather the unwillingness of the farmers to risk their own money (or borrowed money) in innovations. The risk involves not only the loss of the money invested but also the loss of income that the traditional production practices would provide.

The credit in these circumstances should be not merely a loan but an insured loan and an income insurance in case of failure of the new techniques. In other words, credit given for innovations and improvements with which the farmer is not familiar and consequently look too risky to him, should be insured credit that the farmer has to repay only and insofar as the experiment proves successful, provided, of course, that the farmer plays his own part. The insurance moreover would provide the farmer with the income he would get if he had followed his traditional techniques. The condition that the farmer must play his own part has to be handled with extreme care, otherwise it might have negative effects if the farmer gets suspicious that he will be accused of the failure no matter what he does.

This type of credit is not provided in the Central Sierra or anywhere else that we know of. The potentialities of this type of credit are so

great for economic development of primitive agricultural communities that it would be worth while to try even with the risk of total loss of the money. When so much money is used in all kinds of experiments it does not seem unreasonable to use it for experiments on human and economic promotion. Besides, the risk can be reduced to an insignificance if the techniques recommended have been previously tested, if good technicians are available and if the extension agency promoting the innovation can be made responsible for any undue risk and for verifiable negligences.

The farmers have to pay seven percent interest per year for the credit they are provided in the Central Sierra. The international financing agencies are supplying the credit at much lower rates of interest (the part of money provided by AID, Agency for International Development is at $3/4$ of one per cent per year) but the inefficiencies of the administrating agency (The Banco de Fomento Agropecuario del Peru) unduly increase the interest rate. An interest of seven percent per year is, in the Central Sierra circumstances, much too high; it will suffice to remember that invested capital in the Algolan haciendas, was yielding net returns of the order of 4.45 per cent or less. This was of course the overall return. It cannot be denied that some specific investments could, and in fact, have higher returns in the Central Sierra Agriculture but it has to be remembered too that the new farm owners do not have the ability and the organization of the haciendas and that the new farm owners should get from the land an income which could be equivalent to a higher salary that the one the hacienda was paying to its workers.

As stated before, credit can be a powerful instrument for economic development if it is used to encourage the type of investments which are more strategically needed for development and are compatible with the labor supply situation and the type of products demanded in the markets. The channeling of credit on those lines is possible only when a careful overall development plan has been worked out. Unfortunately this plan does not exist in the Central Sierra and consequently the full opportunities that credit offers for economic development go unused.

Technical assistance: The evidence of the data available clearly show the low technical level of production in the Central Sierra. This low technical level appears to be one of the main reasons for the differences in production between the Comunidades and some of the haciendas.

In order to rise the technical level and to improve the production techniques three things are required. First is research to find out what techniques are more adapted to the circumstances of the region. Secondly, is the economic means to do the research and to apply the techniques. Third, is the ability to transfer the knowledge to the farmers.

The Central Sierra program has had in mind the three requirements. It has established a research operation in a part of Algolan to maintain and improve the livestock breeds. It has provided some economic means for conducting the research, which are supplied by the State in the form of salaries to the technicians and direct financing the first years of operation until the selling of livestock can provide the research center with a secure source of income. It has also provided for the transfer of knowledge to the farmers through a network of extension centers called "Centros

de Reforma" and "Unidades Basicas de Asistencia", strategically located in the entire geography of the Central Sierra, and establishing a Center for training farmers in one of the former Algolan haciendas, "La Quinua".

The shortcomings of the solution offered by the Agrarian Reform Institute are both in the implementation stage and in the form and organization of the technical assistance. In the latter an important improvement could be made if the whole extension effort could be more directly dependent on the farmers themselves and less on the Agrarian Reform Institute. The dependence on the farmers could be achieved if the farmers (in the Comunidad or elsewhere) would directly hire or at least decide whether they want the specific personnel offered by the Institute or some other. The personnel, however, would have to be paid mostly by the Institute in the beginning, while the farmers are not yet economically strong enough. A token payment by the farmers though, is necessary, to give a greater sense of reality to the system and to prepare the farmers for a later full payment when their incomes will be high enough. At that moment the whole extension operation would be maintained by the farmers themselves alone. This important modification would have very relevant implications. First it would give the farmers a greater sense of independence and responsibility and secondly it would stimulate the technicians to work well and to please and respect the farmers.

The defects in the implementation stage of technical assistance are found in the fact that the Institute personnel who are performing the extension work are not always well acquainted with the Central Sierra problems and the psychology of the Central Sierra people. Also these personnel were

not always well trained in the university for the work in the conditions of the Sierra. Another reason of failures is the fact that the extension workers are not receiving clear-cut instructions and plans of operation from the Institute headquarters in Tarma. The means of stimulating the personnel to work at their best are often missing in the promotional organization and salaries ranks of the Institute. On the other hand the farmers themselves, partly because of Institute personnel's poor performance and partly because of their distrust of anything run by the Government, have not, generally speaking, always been very cooperative.

A great improvement could be achieved with a better selection of the personnel and an intensive training on the area before sending them to the Comunidades. A good and well thought plan of action should be worked out in the headquarters to serve as a guideline of action to the personnel on the spot. Frequent consultation and exchange of ideas and experiences between the personnel working in the extension work and the personnel in the direction of the project would be very useful for both and would increase the sense of responsibility of the extensionists. The extensionists should try to associate the farmers themselves with extension work, utilizing all available talent for an intensive transfer of knowledge. Funds should be available to pay farmers with skills to teach those skills to others.

Education: On the basis of the collected data in the Central Sierra no correlation exists between the percentage of illiteracy (heads of family illiterate) in each Comunidad and the gross average agricultural income per active farm worker in each Comunidad, nor

with the mean per capita income derived from agriculture, nor even with the percentage of land cultivated from the total available cultivated land.

Some more detailed research was done in some Comunidades, correlating the degree of instruction of individuals and their income, or their level of techniques used, the result has not given any indication that a correlation exists between education and economic performance. Assuming that the data are correct, this finding would indicate that the type of education the farmers have is not relevant to their economic success; or that there are other conditions in the Comunidades that invalidate the positive effects of education. Our hypothesis is that the two elements do exist. First the type of education is not significant because it is not adapted and useful to the needs of the farmers. Secondly, the Community structures does not encourage the use of knowledge for progress and change. The better educated people of the Comunidades do not work at farming and often abandon the Comunidad. We did not find anyone in the Comunidades who had been in College, and very few who have any secondary education.

The Agrarian Reform Institute could not initiate any vast plan of education because of the limitation of its budget. In the farmers training center, however, some education is being given aimed at the preparation of the leaders of the Comunidades who could help to introduce in the Comunidades the necessary change of attitudes for the acceptance of the new ideas involved in technical innovations and agrarian reform. In the Comunidades some teaching has been imparted by social workers ("Asistentas Sociales" y "Mejoradoras del Hogar") to the housewives for better housekeeping.

A whole new type of education for the population of the Central Sierra is needed which could be capable of providing the adult farmers as well as the young population in the schools, the basic ability to adopt the new techniques useful and practical in the area, develop their natural skills and above all open up their minds to new attitudes toward work, social and economic progress and personal achievement. This type of education that raises the expectations of the people is dangerous when the rigidities and inadequacies of the structures of the society frustrate those expectations and desires. It does not seem, however, that the actual structures of the Central Sierra would be strong enough to contain a genuine desire of advancement and a determination to improve conditions through personal effort.

Furthermore this new type of education has to provide the needed skills and flexibility for the full utilization in agriculture and elsewhere of the tremendous potential hidden in the Central Sierra manpower. Human ingenuity of a negligible minority of mankind that has had the opportunity of education has made possible the many wonders of today's world. What could we have if the large masses of people could have a chance to get the right kind of education to put their minds and abilities to work?

It has become fashionable to blame the "excess number" of people, (the effect of the so-called "population explosion") for most anything, even before this excess number could start doing anything actively or passively. We had discovered in the Central Sierra that population pressure on the land has in some instances achieved high productivity yields (though the means used do not give any confidence that the productivity could be continued for a long period of time).

Ester Boserup discovered the same fact that we have discovered and has gone as far as to affirm that "primitive communities with a sustained population growth have a better chance of getting into a process of genuine economic development than primitive communities with stagnant or declining populations" (5, p. 7, 118). She qualifies this statement saying that it might not be true of communities with a very high rate of population growth which are already densely populated, and which are unable to undertake the investment necessary for introducing still more intensive methods of agriculture cultivation.

For the Central Sierra we would rather qualify the statement saying that it might not be true if the actual education system is not improved, general education of the population for genuine progress and advancement is not established, and finally the structure of the Comunidad that impairs development cannot be changed and consequently the more talented people born in the Comunidad are wasted for the Comunidad, whether they abandon it or remain in it inactively. The base of our qualification is 1) the fact observed in the Central Sierra and pointed out before, that education (the actual education) does not seem to have any effect on income and on the technical means used in production, (we share with Dr. Schultz the view that the transformation of traditional agriculture requires mainly investment in human resources (education) and in modern forms of material inputs (32, p. 175, 145), and 2) the observed fact that due to the structural climate of the Comunidades people with entrepreneurial spirit abandon the Comunidad.

Marketing: Few studies have been made in the Central Sierra on market-

ing. The only relatively serious effort was done on the research of horticultural marketing for the purpose of establishing a marketing cooperative in Tarma. Marketing problems in the Central Sierra are severe handicaps to the economic prosperity of the farmers. Insecurity of prices, surpluses and shortages, excessive shares of the revenue taken by the middle man, are all effects of the defective market system prevalent in the Central Sierra.

The Agrarian Reform Institute has been planning to organize the marketing of the wool through the facilities existing in Algodan. It has also been thought to establish a slaughter house for the whole area and explored the possibility of establishing marketing cooperatives for potatoes. The Economica Department of the Central Sierra Agrarian Reform Institute initiated a study Comunidad by Comunidad of the actual marketing channels, amount marketed every week and prices received. Unfortunately this study was not encouraged enough by the Institute directors and was never completed. This study was to be completed with a research project on the demand for the agricultural products of the Sierra in the area and in Lima.

Prospective good prices for the products that are most needed in the markets would certainly encourage production. Competition with a common base of market and prices would stimulate productivity and quality. As the things are now, price often is not a reward to higher productivity and better quality but rather the result of the opportunity to get the right connections at the right time in the inefficient marketing channels. The farmers who are marginal to the actual marketing process because of their geographic situation or their inability to make the right connections, have no stimulus to abandon their subsistence farming system and enter the market.

The Institute should try to encourage the studies initiated. It is important to know well the supply and demand situation and the mechanism of the actual marketing system before any marketing improvement can be made.

The short experience of the horticultural marketing cooperative of Tarma can teach very important lessons with reference to the practical difficulties of altering the old marketing channels and systems. One lesson is that the substituting system might prove to be as inefficient as the old or more as far as bringing higher incomes to the farmers, especially, as it happened in Tarma, the amount of produce commercialized through the new system is not large enough in relation to the fixed costs of the operation. The small amount commercialized in Tarma was due to the distrust of many farmers who did not want to participate and to leakages into the old channels of part of the product of the participant farmers. The high fixed cost was due partly to the high interest the cooperative had to pay for the loan (7 per cent) and the inefficiencies on the part of the management as well as to the fact that the structure had been designed for a much larger operation. Another hard lesson is that it is not easy to find honest and capable men to administer and manage the new marketing system. Finally it is not easy to substitute the former middleman and forget about him. He will fight for his job and can prove a major obstacle in securing markets and good prices. Besides the farmers are often willy-nilly allies of the middleman, because they are tied to him through loans (the middleman is often the source from which the farmer borrows money), or simply because the farmer does not quite trust anybody more than he trusts the middleman. The new marketing system therefore, has to be accompanied with sound and

trustworthy credit institutions which could advance money at reasonable interest to the farmer, set minimum prices for the products and pay in full, or at least in a large part, for the product to the farmer at the moment the farmer is delivering it to the marketing agency.

C. Implementation Stage and Use of the Action Planning and Implementation Model

So far the structures that would seem necessary to make agrarian reform a success have been analyzed on the lines of hypothesis c) and with the aid of the efficiency model of Chapter III. Now the fourth hypothesis d) will be tested. This hypothesis states that "The implementation stage of the agrarian reform proves to be a difficult undertaking, but can be expedited with the use of an action planning model in the vein of Critical Path and PERT methods".

The Central Sierra agrarian reform project is a clear illustration that the implementation stage of the agrarian reform proves to be a difficult undertaking, in fact the project has been characterized with all sorts of inefficiencies, slowdowns and long detours. Of course some of all this could be expected and it might be said it was probably inevitable due to the lack of experience of the directors and to the pressures with which they had to work.

It remains to be proved that the difficulties of the implementation stage can be expedited with the use of an action planning model in the vein of Critical Path and PERT methods. The model was presented in Chapter IV. The first steps to use it were taken in the Central Sierra Agrarian Reform

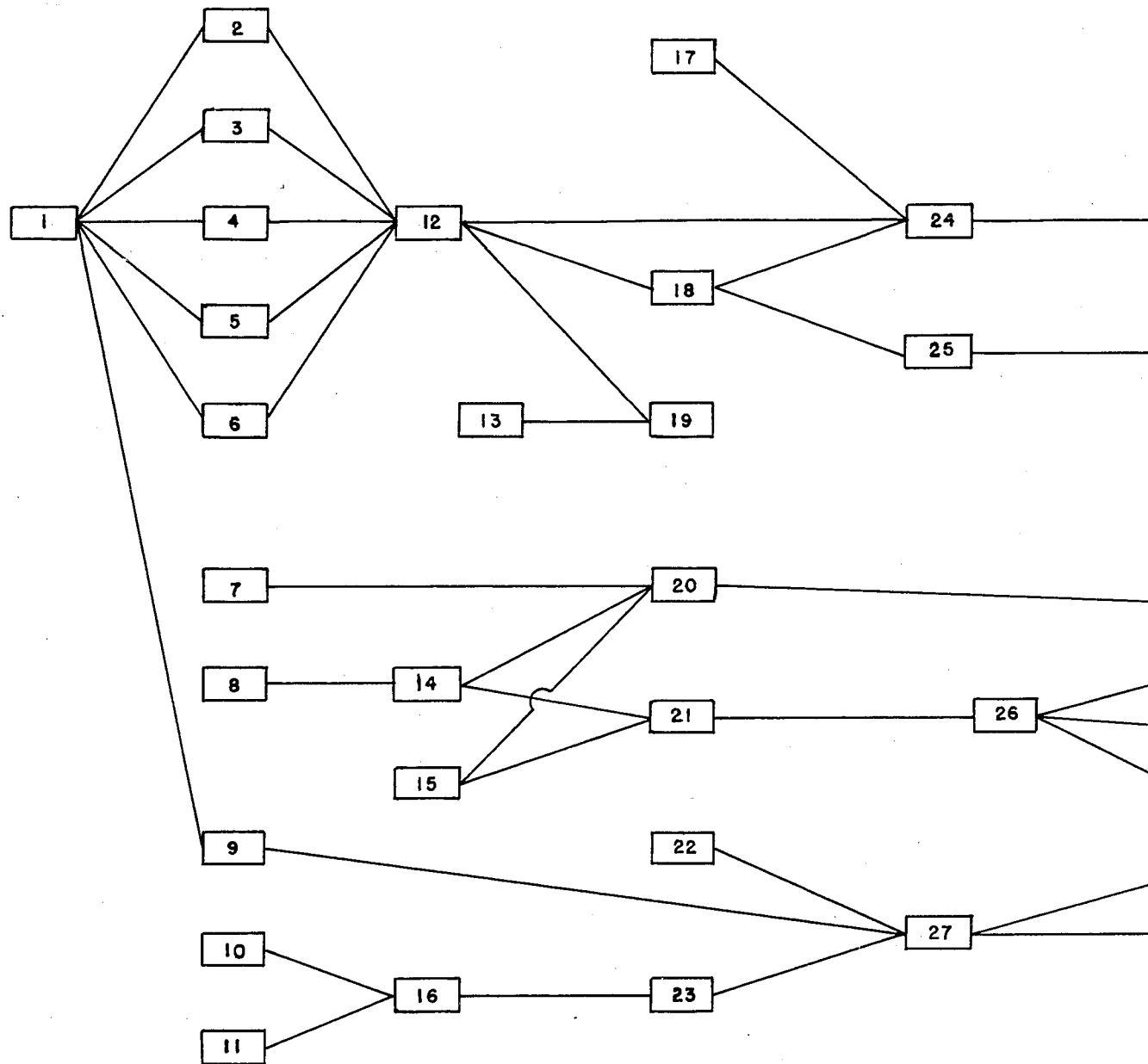
Project in early 1964. In fact three major projects were elaborated with the model. One was the Algolan acquisition and subsequent distribution which included the establishment of a breeding farm run by the Agrarian Reform Institute to provide the new farm-owners with good quality sheep. The diagram of the project is shown in Figure 12. The project starts with the legal acquisition of Algolan [1]¹ and the consequent reception of the livestock [2], buildings [3], accounting books [5] and storage [6] and the evaluation of the natural resources of the hacienda [9]. Once the reception is completed a temporary administration of the hacienda by personnel of the Agrarian Reform Institute is established [12]; this administration of the hacienda will continue until the hacienda is distributed to the new farm owners. A part of the hacienda will be kept under the Agrarian Reform Institute control for the operation of a livestock breeding program [24]. The necessary steps for the establishment and proper functioning of this operation once the side is selected [17] are the financial arrangements [28] and the contracting of personnel to operate it [29]. The purpose of this operation is to improve the livestock of the Comunidades.

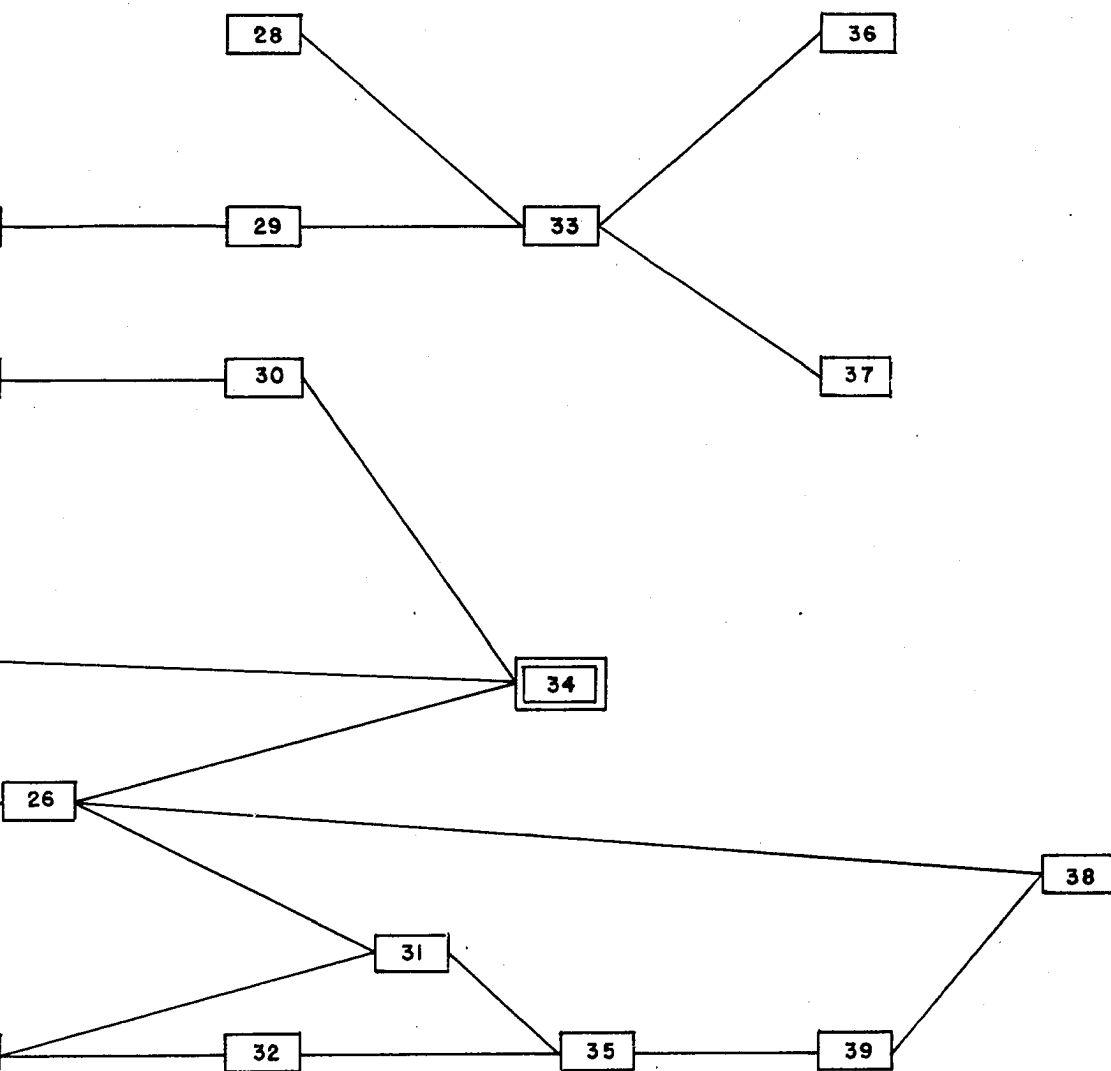
Several parallel actions take place in the project: the establishment of credit facilities [13] and a commercialization center to service the new farm owners [7]; the establishment of centers of technical assistance [8]; the evaluation of the natural resources of the neighboring Comunidades [10] and a socio-economic survey of these same Comunidades and the former Algolan

¹The numbers in brackets correspond to the numbers in the flow chart of Figure 12.

Figure 12. Plan Algolan

1. Escritura de compra-venta de Algolan
2. Recepcion del ganado
3. Recepcion instalaciones
4. Medicion y ubicacion de servicios
5. Recepcion de la contabilidad
6. Recepcion de saldos de almacen
7. Establecimiento de centrales cooperativas de compra-venta
8. Establecimiento de siete unidades de asistecnica
9. Evaluacion de recursos naturales de la hacienda
10. Evaluacion de recursos naturales de las comunidades vecinas
11. Encuesta economico-social de las comunidades vecinas y servidores de Algolan
12. Administracion temporal
13. Constitucion y organizacion del credito a las comunidades, servidores de Algolan y otros
14. Trabajo de siete unidades de asistencia
15. Trabajo de trece unidades de asistencia
16. Estudio economico y social de las comunidades y servidores de Algolan
17. Ubicacion y linderacion de 5,000 Has. para Plantel
18. Cesion temporal de edificios e instalaciones al IRAC
19. Venta de ganado a las comunidades, servidores de Algolan y otros
20. Constitucion de cooperativas de servicios multiples
21. Estudio legal de las comunidades en relacion con los organismos estatales
22. Estudio juridico de formas alternativas de tenencia de tierras
23. Determinacion de beneficiarios
24. Adjudicacion de 5,000 Has., editicios, instalaciones y ganado al IRAC para utilizarlo como plantel.
25. Traspaso de instalaciones a las comunidades, servidores de Algolan y otros
26. Organizacion de las comunidades para la recepcion de tierras y ganado
27. Estudio economico de formas alternativas de tenencia de tierra y utilizacion optima de los recursos de Algolan y de las comunidades
28. Financiacion
29. Contratacion de personal tecnico y administrativo para el plantel
30. Formacion de cooperativas de produccion y comercializacion
31. Determinacion de la forma de pago de las tierras
32. Determinacion de la distribucion de las tierras
33. Financiamiento
34. Reorganizacion de las comunidades para elevar su nivel de vida
35. Aprobacion en Lima
36. Servicio a las comunidades y otros para el mejoramiento del ganado
37. Comercializacion de los productos
38. Adjudicacion legal de las tierras
39. Linderacion de las tierras por transferir.

FIGURE 12 PLAN ALGO



AN ALGOLAN

farm workers [11]. The evaluation of the resources and the survey once completed, supply the necessary information for a socio-economic study of the Comunidades and farm workers [16] which will determine who could be the recipients of the Algolan hacienda [23].

The results of a study of the different tenure forms permitted by the Peruvian laws [22] together with the results of the evaluation of the natural resources of the hacienda [9] and the Comunidades [10] and the assessment of the needs of the population of the Comunidades and the former farm-workers of Algolan [16], supply the elements for a study of the different land tenure forms possible and workable in this specific case [27].

The legal study of the Comunidades [21] in a more broad and comprehensive way forms the base for the organization of the Comunidad for the reception of the livestock and land [26] and for a future deeper reorganization of the Comunidades for economic development [34].

In the project it is assumed that the enterprises formed with the Algolan hacienda will be in the form of cooperatives of production and commercialization [30]. In fact it resulted in the communal enterprise already described and analyzed.

The second plan was for the implementation of Supreme Decree No. 11, which included the expropriation and subsequent distribution of 78,417 hectares. The diagram of this second project is shown in Figure 13 and contains essentially the same elements of the Algolan project, except the establishment of the breeding farm.

The third plan was set up for the acquisition of the hacienda "Conocancha" and subsequent distribution of part of the hacienda land to

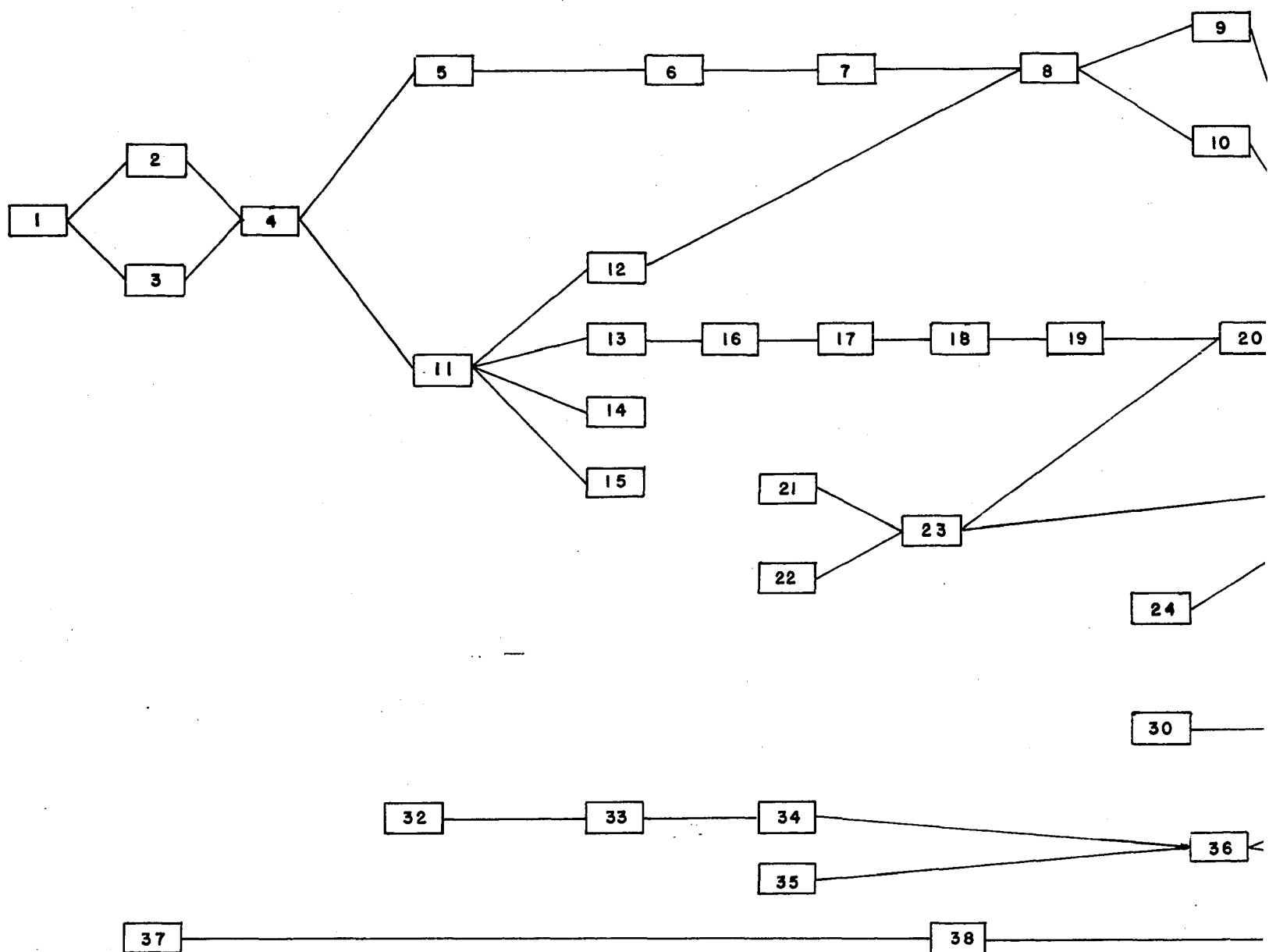
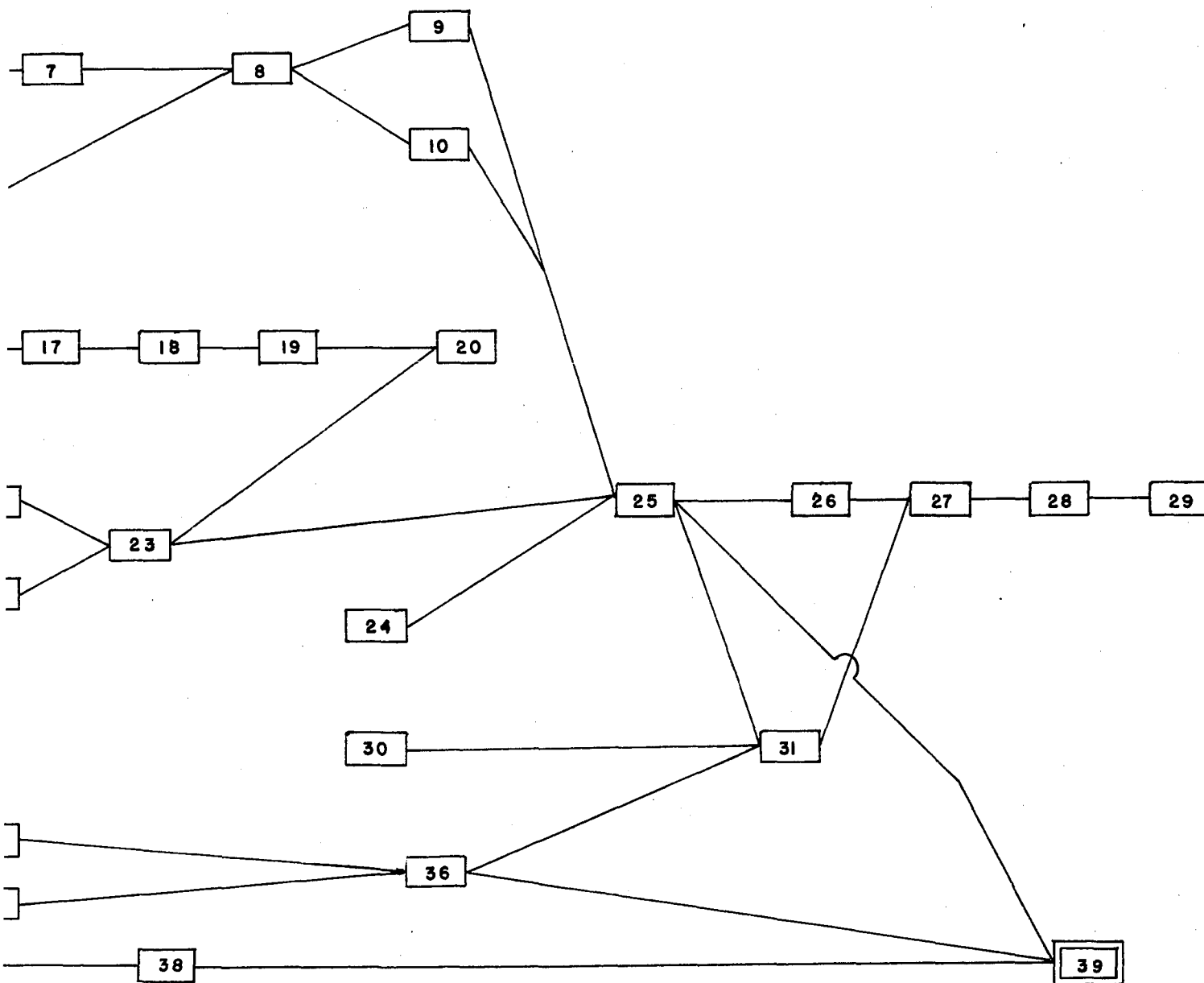


FIGURE 13. PLAN TRANSFERENCIA DE 78,417.0
DECRETO SUPREMO N° 11 DEL 9 DE AGOSTO DE 1,9



LAN TRANSFERENCIA DE 78,417.00 HAS.
MO N° II DEL 9 DE AGOSTO DE 1,963

neighboring Comunidades while using the other part of the hacienda land and all the hacienda buildings for the establishment of a farmer's training center specializing in livestock care. The diagram of the project is shown in Figure 14. The flow chart has the same elements that the Algolan one had, plus the actions necessary for the establishment of the training center like the accommodation of the hacienda buildings for the training center needs [26]; contract personnel [38, 39]; select the students [40]; and buy the furniture and materials needed for the center [41].

The planning of the three projects went as far as the establishment of the network of actions, as it can be seen in the diagrams. Two of the projects were never implemented (Supreme Decree No. 11 and "Conocancha"). The third was partly implemented but little attention was paid to the previous planning. The apparent failure might seem very discouraging and so it was for the planner when the plan was practically abandoned. Still it can be affirmed that the results of the attempt were not altogether negative.

It was not the fault of the planning itself that two of the projects never got off the ground. Other reasons prevented their implementation. Neither was it the fault of the planning that the Algolan project was implemented without consideration of the plan. Much before the plan could be finished and become practicable it was abandoned. But why was it abandoned? An answer to this question would be very helpful in view of future use of the model in similar circumstances and the proof of the hypothesis that the use of the model could ease the difficulties of the implementation stage. The answer will be attempted but before the attempt is made it will

Figure 14. Plan Conocancha

1. Evaluacion de los recursos naturales de las comunidades colindantes
2. Encuesta socio-economica de las comunidades colindantes y los servidores de Conocancha
3. Estudio economico social de las comunidades y servidores de Conocancha
4. Determinacion de beneficiarios
5. Estudio legal de las formas alternativas de tenencia de tierras
6. Estudio economico de formas alternativas de tenencia de tierras para la utilizacion optima de los recursos.
7. Determinacion, planeamiento y distribucion de tierras.
8. Aprobacion en Lima
9. Ubicacion y linderacion de las tierras por transferir
10. Establecimiento de cooperativas de compra y venta
11. Establecimiento de unidades basicas de asistencia tecnica
12. Trabajo de las unidades de asistencia tecnica
13. Estudio legal de las comunidades
14. Constitucion y organizacion del credito a las comunidades y servidores de Conocancha
15. Reorganizacion de las comunidades y servidores de Conocancha para la recepcion de las tierras
16. Determinacion de la forma de pago de las tierras
17. Adjudicacion legal de las tierras
18. Reorganizacion de las comunidades para elevar su nivel de vida
19. Escritura de compra-venta de Conocancha
20. Recepcion de instalaciones
21. Medicion, clasificacion y ubicacion de los planos
22. Recepcion de los saldos de almacen
23. Administracion temporal de 12,000 hectareas
24. Administracion de 5,000 has. reservadas para el Centro de Capacitacion Campesina
25. Evaluacion de recursos naturales de la hacienda
26. Adaptacion de los edificios existentes para el Centro
27. Determinacion y linderacion de 5,000 has. para la granja del Centro
28. Estudio economico de la utilizacion optima de los recursos
29. Establecimiento y contratacion del personal para la granja del Centro
30. Negociacion del credito de compra de ganado, materiales y equipo para la granja
31. Compra del ganado, materiales y equipo para la granja
32. Funcionamiento de la granja
33. Servicios de la granja a las comunidades
34. Comercializacion de la produccion de la granja
35. Servicios de la granja al Centro
36. Establecimiento del Centro de Capacitacion Campesina
37. Contratacion del personal directivo del Centro
38. Contratacion del personal auxiliar del Centro
39. Organizacion definitiva de los planes de estudio y formacion para el Centro
40. Seleccin de los alumnos
41. Compra de los materiales necesarios para el funcionamiento del Centro
42. Funcionamiento del Centro
43. Nuevas construcciones para el Centro
44. Funcionamiento pleno del Centro.

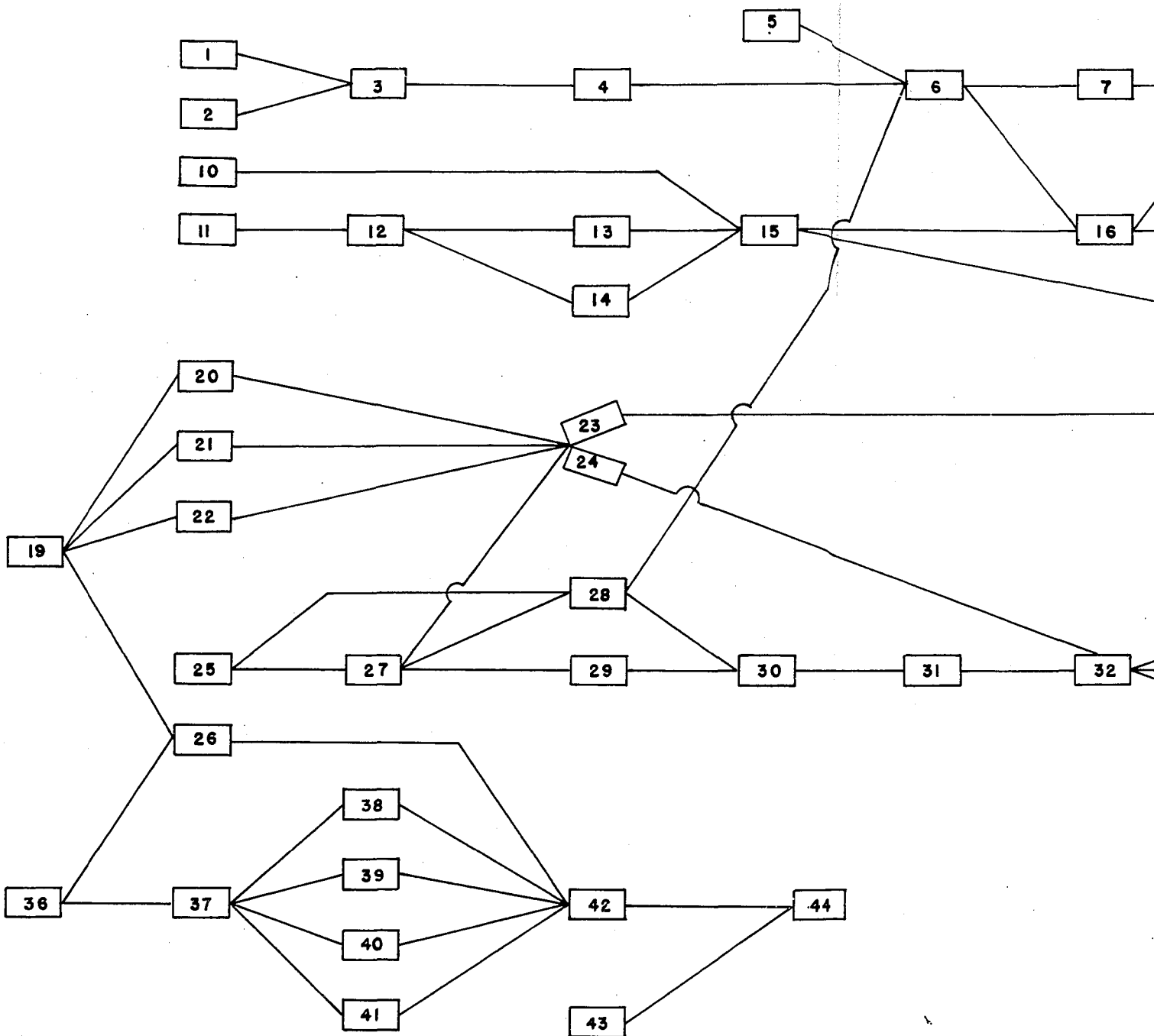
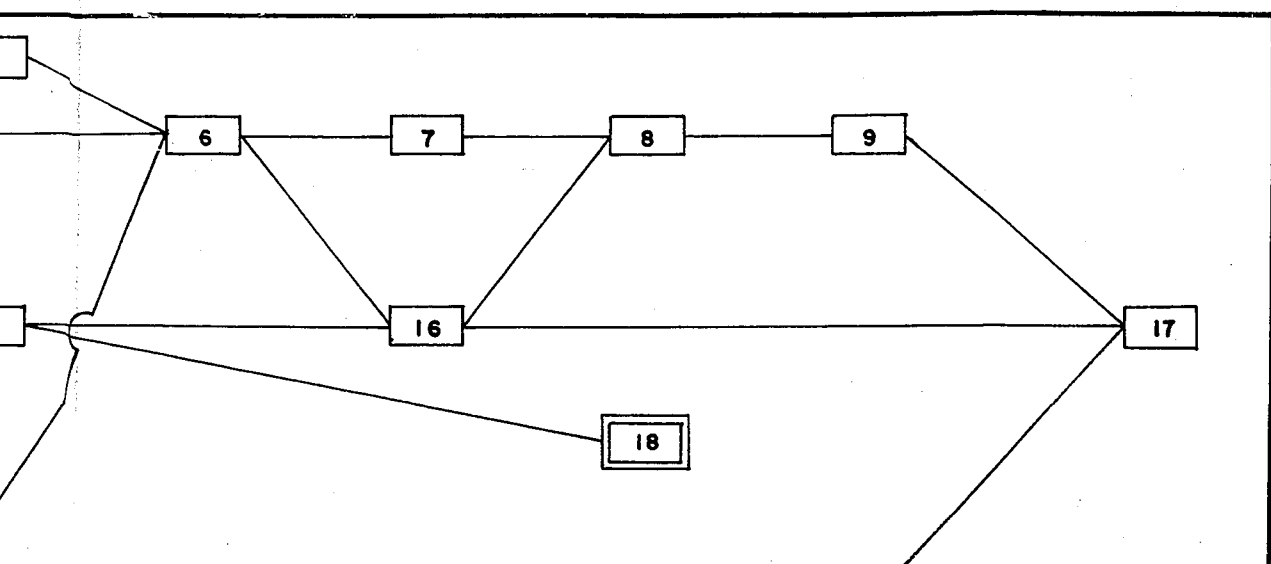


FIGURE 14 PLAN CONOCANGHA



PLAN CONOCANCHA

be convenient to analyze the steps taken and the positive results derived from them.

The first step the planner had to take was to sell the idea of the planning model to the agrarian reform directors. This first part did not prove difficult at all, in fact it was perhaps too easy. This easy acceptance of the planning model might be responsible for not explaining better the need for planning and the advantages of the use of the model to the directors, and consequently not obtaining from them a full and stable support of the planning in a later stage.

The second step was the selection of the most important and urgent projects, and this second step was easy too.

The third step consisted in the patient work of the planner to find out what exactly the Agrarian Reform Institute intended to do in each of the projects where the project should start, and how much was already done. This part was not so easy, in fact many things remained unspecified simply because nobody seemed to know them for sure. However, at the end, a reasonable specification for the planning could be obtained as to the starting point and target.

The fourth step consisted of a series of consultations with the directors and other people who had some experience and knowledge of the necessary action to be accomplished to get from the starting point to the targets. With this information a tentative network of action was elaborated which had to be altered and reshaped practically after every new consultation. The draft of the network had to be written many times over before a satisfactory final draft of the three projects was accomplished. The

directors seemed pleased and even enthusiastic with the plans, ordered them to be printed and put them in the general report the central office in Lima had prepared to show the progress and plans of the agrarian reform in Peru with the remark that this type of planning was applied for the first time to agrarian reform projects.

Strange as it might seem, once the plans were printed, the interest in finishing them (estimates of time and further detailing of many actions were necessary before the plans could be considered ready for use) and applying them faded out.

Important things, no doubt, had been accomplished already with the planning work done in the three projects. The directors had discovered in advance the complexities of the projects they were undertaking, realized the need for some more resources, and up to a point they even discovered the importance and need for planning.

Nevertheless the directors abandoned the planning model at the moment that could prove most useful and rewarding. From a scientific point of view the opportunity of testing the full advantages of the planning experiment was lost and full experience of the model for application in other agrarian reform and regional development programs was not obtained.

Some experience, however, has been gained both positive (how to start the planning and what steps are required) and negative (why the directors lost interest in the model). Something has been said of the positive experience, it will be attempted now to search for answers as why the experiment was discontinued. These answers could help to gain experience on how

to avoid, if possible the negative aspects.

One reason for abandoning the planning has already been given. The directors of the Central Sierra Agrarian Reform Program never did completely understand all the advantages and the value of the planning model, because it was not sufficiently explained to them. This reason, however, does not seem sufficient. Another more forceful reason is found in the way the work in the Central Sierra Program had to be done. The directors were pressed, mainly for political reasons, to do things fast and reach spectacular achievements. This pressure impeded the directors to pose and ponder things, and led them to take shortcuts which in fact turned out often to be long detours and even irreparable dead ends.

Still another important reason can be found in the confluence of two forces on the agrarian reform leadership: the politicalization of the agrarian reform program and the so-called "personalism" where the director and only he, decides and plans. As it can easily be seen both forces converge into isolationism of the directors and into an unwillingness to share the plans and the key decisions with anybody else. These attitudes explain sufficiently the erratic and unpredictable way the program has been conducted.

It is not easy to overcome these difficulties whenever they are found, and consequently it will not be easy to plan successfully when these difficulties are not removed. The planner needs to know all the important details relevant to the plans as well as the probable problems that might arise, if he wants to do meaningful planning. The planner moreover has to be able to check the progress of the plan and the obstacles that block it. The directors therefore must trust, communicate and share all the relevant

knowledge if they want successful plans for action.

D. Alternative Solutions

The final hypothesis (e) states that "There are some suitable alternatives for the solution of the problems that the present application of the Agrarian Reform Law encounters in the vital aspects of land expropriation and land valuation". These alternatives will be presently analyzed.

An alternative to land purchase: The agrarian reform in Peru was from the beginning decidedly orientated to the expropriation of land with compensation or to the purchase of land by contract. This orientation was not easy to change then, and less easy after the Agrarian Reform Bill was passed. It seems appropriate, however, to consider an alternative to the buying or expropriation of the land. This alternative is the expropriation of the use of the land only. The author made the proposition of this alternative after considering the low productivity of the land in the Sierra and after hypothesizing that the land was not the key factor in the solution of the low income problem of the farmers. Why then expend time and large quantities of money in the appraisal and payment of a factor which in itself could not solve the problem and which, due to the limitations of the resources at the State's disposal, would prevent the acquisition of more strategic factors?

Apart from avoiding the tieing of large quantities of money in the first stages of the agrarian reform (not only in the payment for the land which could be done mostly in bonds in accordance with the Peruvian Agrarian Reform Law, but in the appraisal work) the expropriation of the use only,

would allow more flexibility to the agrarian reform process taking or leaving land according to its capacity to satisfy the needs of the new farmers. With this system the process would be as follows:

Once the use of the land is expropriated, the State through the agrarian reform organization, offers the land expropriated to farmers who would fulfill certain conditions and would agree to follow certain technical norms and pay a rent for the land they are receiving. If in the period of the first five years the farmers or group of farmers (the land could be assigned and rented to a cooperative group or to the other forms of collective land exploitation) had fulfilled the requirements and achieved certain standards of performance, they would be entitled to buy the land from the owner, or directly under the supervision of the agrarian reform organization or through the agrarian reform organization. Special legal provisions would then force the landlord to sell the land.

The system would also help the selection of the farmers on the basis of their entrepreneurship and their standard of performance, and consequently would be a stimulus to obtain the most from the land in a rational way.

This system would have transformed the Central Sierra hacienda land into individual, private type of farming enterprises. This would have meant that the Comunidades would have lost the claim to these lands in favor of individuals from the Comunidad or from elsewhere though the individuals would compensate later the Comunidad with amortization payments. Furthermore, this system could have been the beginning of a profound transformation of the Comunidad itself. The comunidad leaders who benefit from the actual

organization would no doubt oppose the system and also some intellectuals who, though they have never lived in a Comunidad, have idealized it and its systems. Obviously, this is not the place to discuss the Comunidad problem in its entirety because it involves other aspects besides the economic point of view which is primarily considered here. One point, however, is relevant. The Indian Comunidad in the Central Sierra is very much in an economic stagnation and the dynamic force to get the Comunidad out of this dilemma does not seem to be the acquisition of more land for the Comunidad but rather the transformation of the production techniques and economic systems of the Comunidad and the economic integration of the now isolated Comunidades with other Comunidades and with the rest of the nation. The relevant problem is not whether the Comunidad has to change (it has to if it wants to survive) but rather how it has to change; how to achieve the necessary economic transformation without losing the positive values that the Comunidades' system might have.

When only the use of the land is expropriated, a direct confrontation with the problem of land valuation with all its emotional overtones, is avoided. If a compensation to the landlords for the use of the land is thought desirable, it can be established at a rather low level without facing too much opposition, especially if the expropriation is presented as an extraordinary measure demanded by the common good and the State invokes the eminent domain it has over the land and reminds the social function of the property according to Article 34 of the Peruvian Constitution "the property must be used in harmony with the social interest".¹

¹Very little has been done in Peru by way of preparing public opinion in favor of necessary measures taken to implement the agrarian reform.

Not all the land need be expropriated; the landlord could retain a part for himself which would be large enough for a successful farming enterprise. The State would buy the livestock the landlord could not be able to support in the reduced area after the expropriation. The State would sell the livestock to the new farmers who are renting the land.

After the five year period when the successful farmers would be allowed to purchase the land, objective criteria of its economic value could have easily been established on the basis of the productivity the farmers were able to obtain.

To appreciate better the advantage of the system of land use expropriation it will help to discuss land valuation a little further.

Valuation of agrarian reform lands: The land valuation problem in the context of an agrarian reform consists in determining objective values of the land, based on the economic consideration of the land productivity or in other words, based on the participation of the factor of production land, in the production results. It presupposes, therefore, that land contribution in the production can be isolated from the contribution of the other production factors and that other considerations than the economic productivity of the land itself, like speculation on the demand for land because of need and/or prestige, are put aside.

The recent land valuation history in Peru shows that the ideal is hard to attain. The land valuation method used by the Agrarian Reform Institute in the appraisal of Algodan failed in isolating land sufficiently from the other factors and consequently incorporated them in the land

values. Land prices therefore did not correspond to the land productivity.¹ In the negotiations for a more objective method presented by the Agrarian Reform Institute to the approval of the National Council in September 1965 the landlords failed to understand that the land values should not reflect the high land demand and scarcity but only the real contribution of land to the production. The Agrarian Reform Law itself is another example of the kind of problems involved in land valuation in Peru.

The Agrarian Reform Law determines in Article 75 the items to be considered in the land valuation.

The price of the expropriated land will be established averaging the following factors:

1) The mean value of the land declared (by the landlords) in the last five years before the affectation (designation as subject to application of agrarian reform law) took place, for the purpose of assessing rural property taxes (Impuesto Predial Rustico).

2) Valuation according to the appraisal performed by the technical personnel of the Agrarian Reform Institute of the potential yield of the land.

3) Direct appraisal according to the quotations of the Technical Appraisal Body of Peru (Cuerpo Tecnico de Tasaciones del Peru).

¹ For pasture land for instance, it was assumed that land contributed 35 per cent of the revenue. When the revenue was high because of the good quality of the livestock or the ability of the management, the livestock and management values were incorporated in the land value. In the final assessment concessions were obtained from the Fernandini family and the final land price was reduced. However, had only the method been considered, higher prices would have been paid.

This system has proved unworkable. Item 1 often is non existent and item 3 gives an arbitrary value based on the demand and scarcity rather than on land productivity. For item 2, a method has been established. The method has two parts. One is technical, (determination of the quality of the land and potential physical production) and the other economic (determination of the expected income dependent exclusively on the land factor).

The Agrarian Reform Institute method was disapproved of by the landlords not because of any technical defect they could find in it, but rather because they felt the resulting prices were too low.

After a year and one half of the promulgation of the Agrarian Reform Law a workable solution to the land valuation problem was not found yet and consequently the Government presented an amendment to the Agrarian Reform Law, according to which the Article 75 would read: "The price of the expropriated land will be determined according to the actual economic capacity of the land, considering the real participation of each of the factors intervening in the production".

The amendment has not been approved as of July, 1966, more than two years after the Agrarian Reform Bill was passed, and consequently the whole agrarian reform process has been retarded seriously.

It is not easy to isolate the factor land and assess its real participation in the production. The new method presented by the Agrarian Reform Institute for valuation of pasture land is based on a budget of a livestock farm with 5,000 head of sheep of the average quality found in the haciendas

of the Central Sierra and using good technical methods and disease control. The budget was hypothetical but the data were real and reasonable. To the operation cost it was added a return to the fixed capital (total invested in livestock and installations - land exempted) consistent with the current interest earned by capital deposited in the Banks (9 per cent) and an enterprise profit (a return to management in the form of a low percentage (5 per cent) of the gross profit). The remaining net profit was considered to be solely attributable to the land, this net profit capitalized at the current interest rate (9 percent as above) gives the value of the land needed to support 5,000 head of sheep. The objection to this procedure is that with the economies or dis-economies of scale the result would vary. Therefore, it has to be assumed that a farm with 5,000 head of sheep is the economic desirable one, which is certainly open to question.

In spite of this shortcoming the prices obtained did not seem unreasonable except to the landlords who were expecting high prices among other things, in order to compensate for the loss in the purchasing power of money, inasmuch as the land would be paid for in bonds that would mature over 20 to 22 years with interest rates of 6, 5 or 4 per cent per year, depending on the rating of the former management of the expropriated haciendas.

To solve the land valuation problem a few considerations might help to clarify the issue. First, it has to be remembered that we are dealing with agrarian reform and with land that has been expropriated by the State for the common good. Therefore, it is clear that the price of the land is not a reward to the landlords or a result of a normal transaction but rather a strict compensation. A strict compensation should cover the actual loss of

income that the factor which is being expropriated, was providing. This means that if a landlord had his land abandoned, the price of the expropriation should not provide him with a higher income than the one he was getting with his land. Strictly speaking therefore, the price of the land conceived as a strict compensation should be tied to the former level of use of the land.

Secondly, the price of land serves two purposes: 1) to determine the payment the Agrarian Reform Institute (the State) has to make to the landlords, and 2) to assess how much the new farmers have to pay to the Agrarian Reform Institute for the land they are receiving. It has been too easily accepted that the two payments do not need to be equal, that the price the new farmer has to pay can, and even should, be lower than the price paid by the State to the landlord. We do not agree with the difference in payment because there is no valid reason for it. The difference is a loss to the State and a hardly justifiable use of the public money, very especially in a country like Peru where a large part of the State's money is collected through indirect taxes which are paid mostly by the less affluent sector of the population which happens to include the large majority of the people of the country. If the farmer cannot pay the price paid by the State to the landlord because the land is not providing him a corresponding return, it is clear that the price paid to the landlord was beyond the economic value of the land as production factor. We assume, of course, that the farmer is paying for the land when the land is in full production. Article 100 of the Agrarian Reform Law, allows the new farmers as much as 5 years grace before they start paying for the land in 20 year installments.

An alternative approach to agrarian reform: Maybe it is now the right time after all these considerations on land valuation and agrarian reform problems to explore another approach to agrarian reform, namely an agrarian reform performed through taxation.

The right of the State to impose taxes on personal income and on personal property as a means of obtaining the money the State needs for its functioning and for providing for the common good, has been accepted practically everywhere. It is also accepted that the State may use taxes to encourage or discourage a determined activity. What will be proposed here, therefore, is not a new principle but rather a new application. The fundamental reason behind the use of a property tax here is to ensure that the land will be used according to its social function which is to produce agricultural products in the quantity and quality required for the national needs and at prices consistent with factor costs while maintaining the production potential of the land.

However, if only the production aspect of this social function were considered, the optimum farm size could be so large or such cultivation methods would be used that only a few number of farm families could be accommodated with the available land. Without getting too far away from the economic optimum, accommodations are necessary in order to increase the number of owners, distribute the income and give opportunities to as many farmers as possible, because of the Peruvian manpower surplus in the agricultural sector which cannot be easily transferred elsewhere in large quantities over a short period.

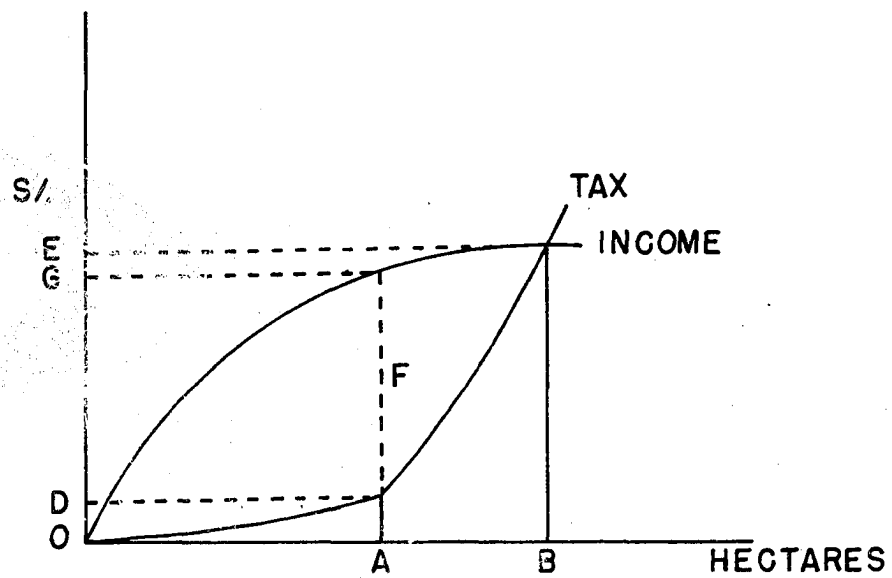


FIGURE 15. LAND TAX

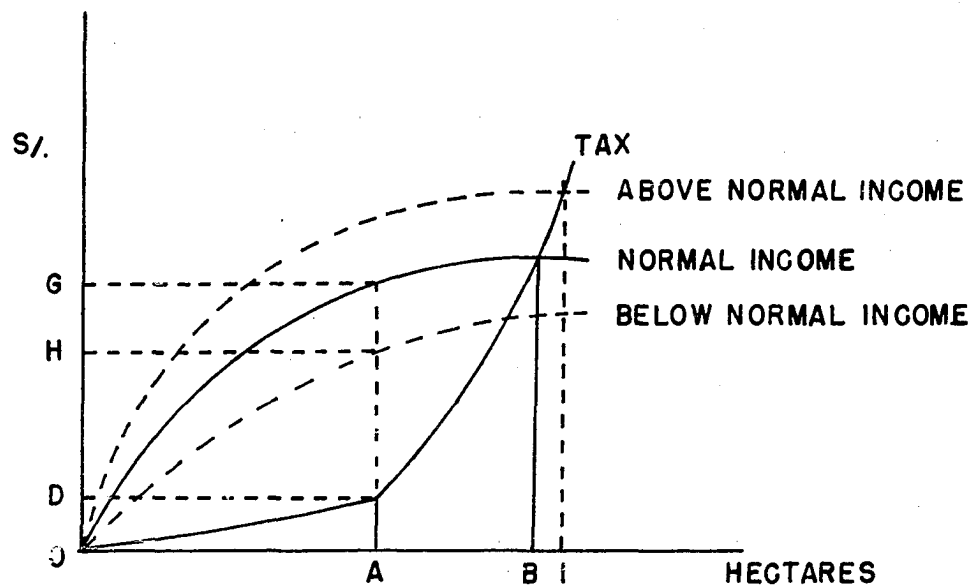


FIGURE 16. LAND TAX WITH ABOVE NORMAL, NORMAL, AND BELOW NORMAL INCOME

The tax therefore is going to encourage this qualified optimum size of farm in every cultivation or combination of cultivations and in every class of land, but will discourage larger farms establishing an upper limit like the Peruvian agrarian reform determines the maximum unexpropriable. The tax will be progressive and up to the upper limit a function of the net income which technically and economically seems feasible. In Figure 15, the point "a" indicates the optimum size farm which is encouraged; at this point the difference between the income received and the tax paid $f = (g-d)$ is at maximum. At no other point is the net income, after taxes are paid, greater.¹ Point "b" is the limit, or maximum non-expropriable. At that point tax equals income and consequently no net profit remains for the landlord. At that point and more so at any further point (larger acreage) it pays the landlord to dispose of his land and reduce it to point "a".

If the land is abandoned, the larger the acreage the higher the loss and consequently the sooner the owner will try to sell it. If the owner does not pay the tax on the land, the land is taken from him by the State as tax compensation. If the land is not cultivated efficiently the income line will be at a lower position, as shown in Figure 16 and the tax will force the landlord to improve his cultivation practices, suffer the loss or sell the land. On the other hand if the efficiency is increased beyond what was considered normal when the tax was determined (normal income of

¹ Note that optimum is modified through the tax. Note also that after the point "a" the tax increases more than proportionally to the acreage.

Figure 16), the income line will be at a higher position while the tax line remains at the same position and consequently the net income will be greater up to point "i" which will be situated a little further beyond the establishment maximum limit of point "b".

In the case of abandoned land, the normal tax would have very little discouraging effect on the landowner to work or dispose of the land up to the optimum size "a". To avoid the possibility of maintaining any amount of abandoned land unworked, the tax in this case would start at level "P". If the land is not only abandoned but its production potential is also severely deteriorated because of non cultivation and lack of conservation practices, the tax would start at level Q, Figure 17.

With this method the State would have a new source of revenue to dedicate entirely to agricultural promotion and to buy lands from the landlords who offer them for sale. Most likely, this new source of income would not be enough for an aggressive agricultural promotion and for the acquisition of lands that will be offered to the State, but will be a substantial help. Further with this method the agrarian reform could be carried out with less cost for the State even in the acquisition of the land because the landlords would be anxious to dispose of the land which would be causing them a yearly loss. That fact would put the State in a strong bargaining position.

The main advantage of the method, however, is that it stimulates agricultural efficiency from the start while at the same time the land structure is reformed.

To ensure the success of the tax method, land transactions should be carried out only through the Government or with the Government approval to

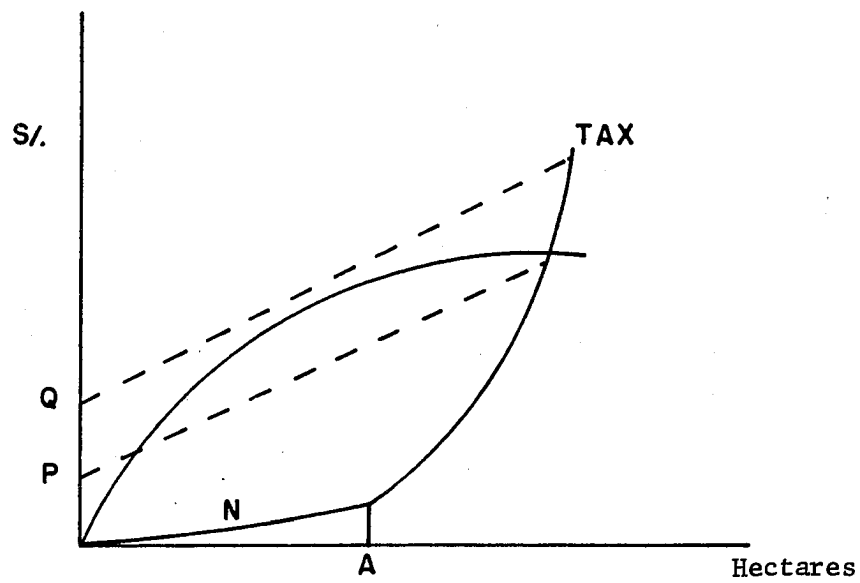


FIGURE 17. LAND TAX IN THE CASE OF ABANDONED LAND

avoid higher prices paid by the small farmers to the landlords. It is also important and admittedly difficult to estimate accurately the normal income function for every type of cultivation and combination of cultivations and for every class of land. The income function estimate, therefore, should be on the low side rather than on the high side to avoid penalizing unduly the landowners and to discourage agricultural investment because the returns might seem too low. The correspondent tax should be flexible so to adjust to poor years and to crop losses due to natural calamities.

Still a more important difficulty for the application of the method is the tax evasion common in underdeveloped countries and the strong political and economic position of the landowners. Probably only strong and extremely able Governments with a good control system capable of detecting and eradicating corruption can successfully apply the tax method presented here.

The discussion about the expropriation of the use rather than the land itself and the problem of land valuation, as well as the suggested agrarian reform accomplished in its first stages through land taxes may appear as digressions from the main point of this study. They are, however, subjects very relevant to the general problem of agrarian reform and consequently to the general theme of this chapter. In fact, the expropriation of the land and the land valuation have proved formidable obstacles in the agrarian reform process in Peru up to now. A more radical approach, like the land tax, is suggested to get around the obstacles and delays

that the present agrarian reform approach in Peru is involved with.

If so much energy, time and money has to go in the first step of the agrarian reform, which is the acquisition of the land by the State, little time and capital remain for the more important steps which are the distribution of the land and what is more important, the establishment of land structures capable of attaining the targets through which the increase in income to the farmers and the participation of agriculture in the national development has to come about.

VI. SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

Summary

The general objective of the study has been to analyze the conditions under which the agrarian reform in the Central Sierra could be instrumental in economic development.

This general objective presupposed and suggested several hypotheses, namely a) That agrarian reform conceived as mere land redistribution is not going to solve the problem of the farm sector of the Central Sierra, that is to say, the problem of the low income level of the farm population. b) That in fact, agrarian reform if it is to help in any significant way to solve the problems of the Central Sierra of Peru has to be conceived primarily as an instrument for economic development of the area and the nation.

The main task of the study has been, therefore, to find out under what conditions the agrarian reform in the Central Sierra could be instrumental in the economic development of Peru. For the accomplishment of this main task hypothesis c) has been central. This hypothesis stated that agrarian reform will be a successful instrument to bring about economic development insofar as the new structures thus created are carefully selected and adequately constructed. An efficiency model can help to test the structures as to their adequacy to contribute to the economic development goal.

Chapter V has been largely devoted to the analysis of this hypothesis c), with the help of the model presented in Chapter III.

The agrarian reform targets for the Central Sierra were related to the economic development of the area and of Peru. They expressed specifically how the agricultural sector of the area could contribute to the general economic development of the country.

Four agrarian structures to be established through the agrarian reform process were proposed as key instruments for the attainment of the targets. These agrarian structures involved land tenure, credit, education and technical assistance and market facilities.

The implementation stage of the agrarian reform where the instruments are set up and used for the attainment of the targets is very critical and difficult. Hypothesis d) refers to that stage and states that "The implementation stage of the agrarian reform proves to be a difficult undertaking, but can be expedited with the use of an action planning model in the vein of Critical Path and PERT methods."

The planning model was presented in Chapter IV and the experience of its application in the Central Sierra was analyzed in Chapter V.

The history of the Central Sierra Agrarian Reform Project has confirmed the first part of hypothesis d). The second part, however, namely that this stage can be expedited with the use of an action planning model, has remained unproven because the experiment conducted in the Central Sierra was not concluded. Some distinct advantages, however, were clearly obtained. Moreover, the identification of the failure elements in Chapter V might well contribute to succeeding analysis as the experiment proceeds.

In an agrarian reform process there are certain things that have to be done necessarily before anything else can be done, like the expropriation

of the land and the land evaluation. Many difficulties have been found in Peru in this first step of the agrarian reform process. To this effect the last hypothesis e) was formulated which states that "There are some suitable alternatives for the solution of the problems that the present application of the agrarian reform law encounters in the vital aspects of land expropriation and land valuation."

The alternatives have been presented in Chapter V, and were 1) expropriation of the use of the land, 2) valuation of land on the basis of its participation in the production results and 3) land tax.

The difficulties of implementing these alternatives have been pointed out as well as their advantages. Among other things new legislation would be required to modify the actual Agrarian Reform Law concerning expropriation, land valuation and the possibility of establishing a land tax. The Peruvian Government has already made a formal proposition to change Article 75 of the Agrarian Reform Law (concerning land valuation) on the basis of the suggestions made here.

The findings of the study could be summarized in the following points:

1) That the targets of the agrarian reform (a) should be primarily economic development in nature and (b) capable of contributing effectively to the agricultural economic development as well as to the general economic development of Peru.

2) That the targets cannot be attained unless the relevant structures are adequately selected, constructed and implemented.

3) That the present agrarian structures in the Central Sierra of Peru are not adequate for the attainment of the type of targets stated in number

1. The steps taken by the Agrarian Reform Institute to create new structures, though some of them are in the right direction, in the whole are not satisfactory. Several suggestions for the improvement and changes of these new structures have been presented and discussed at length in Chapter V.

4) That the four structures presented in Chapters III and V are vital for the attainment of any economic development target.

5) That the setup of instruments and the details of each instrument have to be guided by the targets and the adequacy to attain the targets in accordance with the model outlined in Chapter III.

6) That the implementation stage remains critical and that the use of the implementation model presented in Chapter IV and partially applied in the Central Sierra agrarian reform process can be useful and should be tried again.

B. Recommendations

Though the three targets (stated in Chapter III and V), namely , increase agricultural production, increase the efficiency of the production factors, and transfer production factors, especially manpower, intra-sectorally and extra-sectorally according to the different sectors' needs, and consistent with a balanced national development, seem necessary and sufficient as far as the contribution of the Central Sierra agricultural sector to the general economic development of Peru, they might be complemented with other targets and above all they should be further specified.

The necessary steps for this further specification include the need of collecting additional information. A well-developed plan for data collection is needed to ensure reliable and homogeneous information on all relevant points and to get this information in the shortest time possible and at the lowest possible cost.

In order to specify further the target of agricultural production increase for instance, a better study of the physical capabilities of the Central Sierra land and the potential improvements in the livestock is needed. A study of the market is also needed to find out the actual and prospective supply and demand of the agricultural products of the Central Sierra.

For efficient development planning of the Central Sierra, further research would be required on the apparent success and failure elements in the haciendas and in the Comunidades. The hypothesis advanced in this study that the reason for the productivity differences between Comunidades is the population pressure on the land should be further tested and other possible explanations explored.

A study on the prospectives of demand and supply of labor in the area and outside it, specifying the type of jobs and the abilities required should also be carried out to plan the right forms of formal education and training.

Much more research and testing is required on the relevant instruments to attain the targets, especially with respect to the recommendations made in Chapter V.

The study has dealt only with one form of land tenure, specifically, namely the communal enterprise because this is the type of structure that the agrarian reform process is creating for the moment in the Central Sierra. The other types of land tenure structures established in the Agrarian Reform Law, however, require special attention, like the family farm whose rigidities pose a problem of very serious economic consequences because the land tenure structure under family farms becomes solidified, whereas the changing circumstances require land tenure structures of a flexible and dynamic nature. (See Article 96, Agrarian Reform Law.) Also with the implementation of the agrarian reform law Title 15, a large minifundia problem has already been created in Peru.¹

C. Conclusions

The complexities and frustrations of the implementation process of the Peruvian Agrarian Reform might at times overcome the Peruvian policy makers and the people of good will involved in the daily activities of the Agrarian Reform Institute. The slowness of the implementation process and the inadequacy of the solutions might bring despair to the rural landless population of Peru. Both groups might be tempted to take short cuts and drastic measures. The real solution, however, will not likely come

¹Agrarian Reform Law, Title XV, Articles 244 through 247. Preferential rights of the farm workers in the haciendas. These rights transform the farm-workers into owners of the land they occupy permanently in the haciendas. This land consists normally of small plots of often marginal land, which use is given to the farm workers by the landlord as a form of payment for the services performed in the hacienda.

any other way than through sound economic policies, well developed programs and perseverance.

These policies and programs, in turn, must arise from studies and a broader understanding of agrarian reform as being applied in Peru. This study, hopefully, is a step in this direction.

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IX. APPENDIX

A. Articles of the Peruvian Agrarian Reform Law Relevant
to the Preceding Study

The following translation of the Peruvian Agrarian Reform Law was done by Dr. Fred L. Mann of the Iowa University Mission in Peru, on July 16, 1964 and published in ditto form in a Joint USAID/Embassy Airgram AID/W TOAID A-106.

AGRARIAN REFORM LAW

LAW No. 15037

THE PRESIDENT OF THE REPUBLIC

WHEREAS:

Congress has enacted the following law:

THE CONGRESS OF THE REPUBLIC OF PERU

Has enacted the following law:

AGRARIAN REFORM LAW

PRELIMINARY TITLE

Article 1. Agrarian Reform is an integral, peaceful and democratic process for changing the agrarian structure of this country and promoting our economic and social development by substituting the system of excessively large and small estates for a just system of land ownership, tenure and operation that will serve to increase the production and productivity of the land, complemented with timely and adequate credit, technical aid and marketing and distribution of the products in such a manner that the land becomes a basis for economic stability, the foundation of progressive welfare and the guarantee of the dignity and freedom of the man who works the land.

Article 2. In accordance with the purposes specified in the preceding article, Agrarian Reform Legislation must:

- a) Guarantee and regulate private rights in land so that they may

be used in accordance with the public interest, and establish the limitations and characteristics to which rural real property is subjected in accordance with the Constitution;

- b) Diffuse and consolidate small and medium sized estates of owner-operators;
- c) Guarantee the property rights of Indian communities in their lands and transfer to them the areas they require to satisfy the necessities of their population;
- d) Promote the organization of cooperatives and develop model community systems of land use;
- e) Insure the adequate conservation, use and recovery of natural resources, especially of irrigation water;
- f) Regulate agricultural contracts, tending to progressively eliminate indirect forms of operation so that the person who works the land may become its owner.
- g) Progressively improve the systems of agricultural labor and social security, bearing in mind the special characteristics of agricultural work, and abolishing all relationships that de facto or de jure, link the granting of usufructary rights in land with the rendering of personal services;
- h) Promote agricultural and livestock development for the double purpose of increasing production and improving the distribution of income within the farm sector; and
- i) Organize agricultural credit so that it is available to the farmer.

Article 3. The State, through its own measures and in cooperation with private initiative, is obligated to:

- a) Increase the cultivable area through development and improvement of

irrigation systems, as well as to progressively incorporate into the economic development of the country the inefficiently utilized areas or those inaccessible to reasonable and technical operation due to lack of communications systems, sanitation facilities or similar factors;

b) Establish and improve public services necessary and adequate for transforming rural living conditions and for assisting farmers to fulfill the obligations imposed by this law;

c) Create the bases and necessary conditions for the expansion of the domestic market, for the processing and marketing of farm products and for expansion of foreign markets; and

d) Relate Agrarian Reform to the industrial development of the country.

Article 4. The State assumes the obligation to carry forward the financing of Agrarian Reform and the plans of agricultural development, and shall include every year, in the Functional Budget of the Republic, the financing necessary to cover the obligations incurred in fulfilling this law.

Article 5. The expropriation of rural privately owned land, under the conditions expressly established by the present law, for purposes of agrarian reform, is hereby declared to be of public utility and in the social interest.

TITLE I

LIMITATIONS AND OBLIGATIONS OF RURAL PROPERTY

CHAPTER I

AFFECTATION

Article 7. All rural lands in the national territory, regardless of ownership and location, are subject to the Agrarian Reform Law, and to the

the extent said Law is not applicable, to the general law.

Article 8. For the purposes of this law, "affectation" is a restriction to the right of property in rural lands, as established expressly and specifically for Agrarian Reform purposes, applicable to all or any part of a rural landownership unit, for its expropriation by the State, and its later transfer to small farmers duly qualified under this law. -- Partial affectation shall not limit the free right of alienation of the remainder of the property.

CHAPTER III

RURAL LANDS OWNED BY PRIVATE ENTITIES

Article 13. For purposes of enforcing Article 34 of the Constitution, rural lands are considered not to be used in accordance with the public interest in any of the following cases:

- a) Deficient operation or abandonment of the land, as well as poor management and conservation of renewable natural resources;
- b) Existence of antisocial or feudatory land use forms;
- c) Unjust or unlawful labor conditions;
- d) Concentration of land ownership in such manner that it is an obstacle to the diffusion of small and medium sized rural land units, and which creates an extreme or unjust dependence of the population on the owner; and
- e) Minifundio (very small plots)* or fragmented holdings such that

* Materials in brackets are explanatory editorial additions and not a direct part of the law text.

cause poor use or destruction of natural resources, as well as low returns to the factors of production.

Article 14. Idle or uncultivated lands shall be affected in their totality, based on a previous declaration of the Institute for each zone.

TITLE II

CHAPTER III

LAND VALUATION

Article 75. Just compensation for expropriated land shall be determined by averaging the following factors:

1. That which corresponds to the average value declared during the immediately proceeding 5 years prior to the affectation, for purposes of determining the amount of the Rustic Land Tax (Impuesto Predial Rustico).

2. Valuation based on the increase in the potential yield of the land, as determined by technical personnel of the Institute of Agrarian Reform and Promotion.

3. Direct valuation based on the latest standards of the Technical Corps of Appraisers of Peru.

Article 76. Livestock, permanent crops and appurtenances shall be valued separately and paid in cash. The valuation shall be made considering average market prices, actual production, and data from the owner's books and records.

Article 77. The value of uncultivated or idle lands shall be based on potential productivity, from which value the amount of investment required to reach such potential shall be deducted.

TITLE IIIINCORPORATION OF NEW LANDS AND IMPROVEMENT OF EXISTING LANDS

Article 78. The financing and execution of irrigation improvements on the Coast and in the Sierra, and the reclamation of new lands in the Jungle, is hereby declared to be of national utility and necessity.

TITLE IVALLOTMENTS

Article 91. Allotments of Agrarian Reform Lands shall be made in accordance with the regulations contained in this Law.

Article 92. Ownership allotments shall be made by the Institute to landless peasants (campesinos) or peasants with insufficient land. In accordance with the provisions of Article 211 of the State Constitution, Indian Communities, as well as Cooperatives, as the case may be, are entitled to the same priorities.

Article 93. Lands occupied by feudatarios* and small renters, on the

*Article 17. For purposes of this law, feudatarios are colonos (tenant farmers), yanaconas (feudatory tenure), aparceros (sharecroppers), arrendires (share tenancy), allegados (sub-share tenants) and other similar feudal tenure relationships that include as a condition to the use of the land, the rendering of personal services, whether or not with payment of wages.

date of affectation, shall have absolute priority for the allotment of the lands they are working. When there has been an excessive fractionation or fragmentation of agricultural units, and the Institute decides to execute a reparcellation of the land, the feudat^ories and small renters not receiving an allotment shall have absolute priority to other allotments within the same zone or in the nearest colonization projects.

Article 94. Allotments shall be made only to natural persons, to Indian Communities and to Cooperatives previously qualified by the Institute. The method of allotment shall be determined by the Institute, considering the sociological characteristics, the economy of the zone, the amount of land, and the type of crop or livestock operations established or to be established.

Article 95. When allotments are made to natural persons, they shall be family size farm units. In exceptional cases, only where the lands were occupied by feudat^ories or small renters, can minimum agricultural units be established, provided, however, that the income therefrom is supplementary in nature.

When dealing with new land colonizations, the Institute is authorized to allot to natural persons land units which permit the establishment of medium-sized crop or livestock enterprises. The area of such units cannot exceed ten times the size determined for family size farm units. In no case can more than 30% of a colonization area be used for this type of units.

Article 96. The family size farm unit is hereby defined as the area of land that can be directly worked by the farmer and the members of his family, under reasonable conditions of efficiency, which also fulfills the following requirements:

a) Absorbs all the work force of the family and not require outside labor except during certain periods of the crop year, and in a proportion not greater than one-fourth of the annual work capacity of the family;

b) Provides the farmer with sufficient net income for the maintenance of his family with an adequate standard of living, and to fulfill the relevant obligations for purchasing the allotment, as well as to accumulate a certain margin of savings. The areas allotted as family size farm units can be neither divided nor combined.

The land area required for establishment of family-size livestock units, in cases where applicable, shall be fixed by the Institute, taking into account the provisions of subsection b) of this Article.

Article 97. The Institute shall determine the area of the family size farm unit for each zone, using as a basis the work capacity of the average family, expressed in labor units, as well as the economic capacity of each class of land.

Article 98. Allotments shall be made as a part of an entire colonization project, planned by the Institute, when the number of settled recipients so justifies, as well as in any case of allotment of affected lands with a significant productivity level.

Article 99. Colonization is understood to be the organized settlement of groups of farmers in agricultural units as contemplated in the present Law, with the granting of technical, economic and social aid to such groups during the necessary period until they can continue without assistance, including as well the provision of ordinary public services.

Colonization projects shall be executed in new lands as well as in lands already occupied and operated, and can include new recipients or established farmers.

Article 100. Allotments shall be made by a buy-sell contract, with reservation of title, for a price fixed pursuant to the economic capacity of the agricultural unit allotted. In no case can the contract price be greater than the cost of acquisition of the land, plus the cost of improvements to the unit.

The purchase price shall be paid in twenty annual installments from the date of allotment, with right of prepayment, at the option of the recipient of the allotment. The Institute is authorized, in special cases, to declare a moratorium, which in no case can be for more than five years. The Institute is also authorized to establish the interest rate to be paid on the outstanding balance.

The Institute shall take measures to contract or organize collective life insurance, premiums for which shall be paid prorata by all interested parties, such insurance fund to be used to pay the balance due on the purchase price for an allotment if the recipient should die.

Article 101. The Institute shall select allotment recipients by a point classification system which shall take into consideration: a) age of the applicant; b) his family's work capacity; c) family obligations; d) experience in agricultural work; and e) school grade completed. In exceptional cases, the Institute may select by lots from among those who satisfy the minimum required conditions.

Article 102. To be admitted as a candidate for allotments, the requirements are:

- a) To be a Peruvian
- b) To be not less than 18 nor more than 60 years of age, unless, in the latter case, the candidate has a 17 year old son to work with him;

- c) To be capable of agricultural work;
- d) To be a farmer or farm worker. Graduates of agricultural schools or Institutes shall also have an option to new lands;
- e) Not be a landowner or else own less than a family-size farm unit.

Article 103. The management organizations established by the Institute in colonization projects shall have the following principal functions:

- a) Install farmers in the units allotted to them and provide them with technical, economic and social aid;
- b) Promote the formation of cooperatives;
- c) Allocate irrigation water. Open and maintain community roads and public services in collaboration with the appropriate Government agencies.
- d) Supervise the fulfillment of the obligations connected with the acquisition and operation of the unit;
- e) Cooperate with farmers in the marketing and processing of their products;
- f) Promote the various aspects of community life, encouraging appropriate activities and services, procuring the installation of civil and political authorities as soon as environmental conditions permit;
- g) Mediate in conflicts between the land recipients.

Article 104. The recipients of family-size farm units obligate themselves in their contracts to comply with the following essential conditions:

- a) Directly and personally work the land;
- b) Live with their family on the allotted farm unit or nearby;
- c) Not to sell, encumber or transfer for any reason, the ownership interest in the allotted unit before payment of the purchase price, and

even in such case, not for 10 years after the date of the allotment. In special cases and especially when dealing with minimum agricultural units, the Institute may authorize the transfer of ownership before the expiration of the period specified in the preceding sentence if transferred to an established recipient of another allotment, or, if the person to whom it is transferred satisfies all of the conditions required in this law for eligibility;

d) Personally or economically contribute in a proportional manner to the labor and services of common interest executed in the nucleus corresponding to his unit;

e) Pay, when due, the amortization installments for the purchase of the allotted unit, and fulfill the obligations contracted with the institutions authorized by the Institute;

f) Become a member of the cooperatives promoted by the Institute;

g) Obey directives of a technical and administrative nature issued by the Institute.

Article 105. Breach of contractual obligations referred to in the preceding Article shall be sufficient cause for the Institute to exercise its authority to rescind the relevant contract. The contract also shall be rescinded when the recipient owes two consecutive yearly installments. Rescission proceedings against contracts for the preceding causes shall be instituted before the Land Judge by summary proceeding, and the Judge will not hear prior interpositions. Once rescission or ejectment has been ordered, the allotment recipient is entitled to the recovery of the installments paid by him, after deducting amounts due from loans made by the Institute or by institutions authorized by it, as well as the estimated

rental value for the time he operated the allotment tract.

The decision of the Land Judge can be appealed to the Superior Court within three days, and its decision cannot be appealed.

The time of ejectment, if there are growing crops or livestock to be removed, shall be fixed by the Judge, with a maximum period of ninety days.

TITLE VI

INDIAN COMMUNITIES

Article 127. The system of rural land tenure of Indian Communities shall be subject to the provisions of this Law, with the guarantees and limitations specified in the Constitution of the Republic.

Article 128. To fulfill the provisions of the present Law, the Institute of Agrarian Reform and Promotion shall promote, by all means available to it, cooperative organizations in the Communities, and shall assist in their technical, economic, social and cultural development.

Article 129. Allotments of lands to Communities shall be granted with the express condition that in no case can the fee ownership be transferred to members of the Community or to third parties. The members of the Community can obtain only an individual usufruct to the land, within systems compatible with community or cooperative organization. Lands used as pastures, waters and forests shall be common lands benefitting the Community and all its members.

Article 130. Lands of Communities which came into the private possession of one or several of its members after January 18, 1920, shall continue to be owned in fee by the Community, without changing such

possessory right, hereby making such lands inalienable and nontransferable, whether by contract or by inheritance.

Lands allocated to members of the Community before the Constitution of 1920 shall be subject to the provisions of affectation, as specified in this Law, for the benefit of the Community.

Article 131. All acts of transference of the fee interest to lands belonging to Communities, executed in favor of third parties, whose original document of transfer was executed subsequent to 1920, are without legal effect.

Furthermore, grants of lands from the Government to private individuals for irrigation purposes, which are detrimental to the land interests of Indian Communities, and to lands that are communally operated, are without legal effect, and such lands shall hereby revert to their original owners. Said reversion shall be effected after indemnization, as specified in the provisions on land expropriation in this Law.

Article 134. The State, through the Institute, shall see to the development of technicians, at different levels, providing for their education, after which they shall be obligated to work in the Community of their origin.

Article 135. The Community shall reassert its possession of abandoned and idle parcels of land not directly operated by members of the Community, as well as abandoned parcels, upon payment for necessary improvements that have been executed on them.

Article 136. The Community Cooperative Bank shall be created, with contributions by the State, by Indian Communities, and by domestic and foreign organizations that participate in it. The Bank shall serve

as a Supervised Credit financing agency, directly serving the Indian communities.

The Law shall fix its capital and special conditions for its operation.

Article 137. A Special Statute shall govern the organization and functioning of Indian Communities, regulating their economic system, form of government, community services and other characteristic institutional structures.

Article 138. The use of waters corresponding to the lands of Indian Communities are included among the rights fully guaranteed by the Constitution.

Article 139. In cases where no legally recognized communities exist, but where there exist ayllus, parcialidades (group arrangements) and other similar methods of community operation, these shall be subjected to the provisions of this Law applicable to Indian Communities.

TITLE IX

TECHNICAL, ECONOMIC AND SOCIAL ASSISTANCE

Article 166. Provision of technical, economic and social assistance to small and medium size farmers, Indian Communities, and to cooperatives, constitutes an essential part of the Agrarian Reform program. Indian Communities and cooperatives shall be given preference in receiving such assistance. The Institute shall participate, together with the appropriate state institutions, in the organization of such assistance in the Agrarian Reform zones.

Article 167. It is the direct responsibility of the Institute to provide the services referred to in this Chapter to farmers in colonization projects of new lands, and in those lands made available through Agrarian Reform pursuant to the present law. For these purposes, the Institute shall employ its own resources or contract for appropriate state services or act in collaboration with other state sources.

Article 168. All public agencies, state services and quasi-public services, are hereby obligated to collaborate in the provision of Technical, Economic and Social Assistance in those fields within their competence.

Article 169. Technical assistance shall consist fundamentally in the work of orientation, counselling and demonstration of systems and practices which serve to increase productivity and guarantee the proper conservation of natural resources, for the benefit of the farmer and the national community.

Article 170. The Institute in collaboration with the Universities, and the Institutes of higher education, shall formulate plans for the training of technical personnel at an intermediate level in numbers required for adequate execution of its functions. Centers shall also be established for the training of farm leaders to collaborate with the agricultural extension services, social assistance, and, in general, the work of community development.

Article 171. Technical Assistance shall be aided and complemented by the diffusion of education at all levels, that is: primary education oriented to agriculture, vocational education, basic adult education, practical courses and circulating agricultural extension instructors. For this purpose, the Institute shall coordinate its action with the Ministry of Public Education and the Institutes of Agricultural Training,

as regards the plans and programs of study, as well as the location and types of schools to be established.

Article 172. Economic Assistance shall comprise, fundamentally:

- a) The granting of credit in various forms to the Indian communities, to small and medium individual farmers, as well as to cooperative societies formed by them.
- b) Financial assistance in the form of reimbursable credits for the provision of initial capital for credit, production or service cooperatives, as well as for the establishment of warehouses, silos, machinery pools, transport services, processing plants for agricultural or livestock products, and other similar facilities for such cooperatives.
- c) Direct investments made by the Institute for the establishment of plants for the processing of agricultural products, for making them available for marketing or for preliminary processing.

Article 173. The provision and supervision of credits to medium and small farmers shall be in charge of the Agricultural Development Bank.

Said credits shall be divided into two main groups:

- a) Ordinary loans that the Bank shall grant for its own account, and with the form, periods, guarantees, interest rates and other conditions established in its Organic Law and other legal dispositions.
- b) Special loans designated as "Agrarian Reform Credits", granted for the account of the Institute, and with funds made available by the Institute.

Article 174. The Institute shall be authorized to execute the operations referred to in subsection b) of the previous article, through the medium of the Community Cooperative Bank, and Cooperative Societies that are previously qualified.

Article 175. The Institute shall deliver an additional guarantee in favor of the Agricultural Development Bank or the Community Cooperative Bank to cover up to 20% of the amount of each ordinary loan referred to in subsection a) of Article 172, granted to cooperative societies or Indian Communities.

Article 176. The Institute shall allocate annually in its budget, a sum, based upon the magnitude and nature of projects underway, for the formation and increase of a Trustee Fund in the Agricultural Development Bank for granting loans designated as "Agrarian Reform Credits." The administration of these credits and the Fund shall be undertaken by a Council formed by three representatives from the Institute and two from the Bank. The form and manner of granting of these loans, as regards legal documentation, amount, term, interest, guarantees and other conditions, shall be established by the Council of the Fund.

The dispositions of this Article also are applicable to the Community Cooperative Bank.

Article 177. Social Assistance essentially shall comprise counseling in the organization and development of civic life, sanitation, hygiene domestic economy, improvement of the home, family education and religious services.

Article 178. Technical, Economic and Social Assistance services shall be provided through centers established in accordance with the number of

families comprised in each project. Each center shall have, without exception, resident personnel.

Article 179. The Institute shall assist farmers in the marketing of their products. For this purpose, the Institute shall provide:

- a) Guidance as regards crops and livestock with respect to the situation in domestic and foreign matters.
- b) Instruction in technical preparation and conservation of crops and animal products.
- c) Encourage the construction of silos, refrigeration units and other types of storage.
- d) Stimulate the construction of, or invest directly in, processing plants for agricultural and animal products, or in the primary processing of such products.
- e) Collaborate with the Ministry of Agriculture and the municipal authorities in the establishment of markets for products.
- f) Establish, in collaboration with the Agricultural Development Bank, loans guaranteed by products.
- g) Collaborate with the Ministry of Agriculture and other state organizations in all matters related to marketing of agricultural and animal products.

TITLE X

AGRICULTURAL COOPERATIVES

Article 181. The State shall encourage, in all ways, the organization and operation of agricultural cooperatives for credit, production, mechaniza-

tion, marketing, services and other similar objectives related to crop and livestock production.

Article 182. The State shall promote the organization of courses of instruction dealing with agricultural cooperatives, preferentially in Rural Schools, in Crops and Livestock Institutes, in Agricultural Organizations, and other similar establishments, and shall organize training and pilot project programs with reference to agricultural cooperatives.

Article 183. The State shall sponsor the creation of Rural Cooperative Banks, which shall assist in the appropriate diffusion of agricultural credit and savings among small and medium farmers, and in the establishment of handicraft industries in rural areas.

Article 184. Agricultural cooperatives shall be governed by the Cooperative Legislation and its regulations.

TITLE XII

THE ORGANS OF EXECUTION OF AGRARIAN REFORM

CHAPTER I

THE INSTITUTE OF AGRARIAN REFORM AND PROMOTION

Article 191. The Institute of Agrarian Reform and Promotion is hereby created as an organ of the Executive Power. Said Institute shall comprise a part of the Ministry of Agriculture, and is administratively dependent upon it. Its functions and powers and duties are specified in the present law and its regulations.

Article 192. The Service of Agrarian Investigation and Promotion

(SIPA) shall be a part of the Institute of Agrarian Reform and Promotion. Its administration and direction shall be executed by the National Agrarian Council and the Director of said Service.

Article 193. The plans and programs elaborated by the Institute shall form a part of the National Development Plan.

Article 194. Organisms of the Institute of Agrarian Reform and Promotion are:

National Office of Agrarian Reform, and Service of Agrarian Investigation and Promotion.

Article 195. The Institute of Agrarian Reform and Promotion shall be governed by the National Agrarian Council, consisting of the following members:

The Minister of Agriculture, who shall preside;

Two delegates from the Ministry of Agriculture, one of whom shall act as Vice President;

One delegate from each of the following institutions: Ministry of Labor and Indian Affairs, the Agricultural Development Bank, the Agrarian Reform Finance Corporation, the National Office of Cooperative Development.

Members of the Council shall also include:

One delegate from the Agricultural Societies,

One delegate from the Livestock Associations,

One delegate from the Confederation of Peruvian Workers (CTP) and

One delegate from the National Federation of Campesinos (Fencap)

With voice, but without vote, the following shall be members of the Council: one delegate from the Senate, one delegate from the Chamber of Deputies, the Director of the Service of Agrarian Investigation and

Promotion, and the Director of the National Office of Agrarian Reform, the latter who shall act as Secretary.

Article 196. The manner of designation of the members of the National Agrarian Council shall be specified in the Regulations to the present law.

Article 197. Functions and attributions of the National Agrarian Council are as follows:

- 1) Direct the policy of Agrarian Reform and Promotion.
- 2) Comply with and require compliance with legislation relative to Agrarian Reform and Promotion.
- 3) Prepare regulations for this law and remit them to the executive Power for approval.
- 4) Investigate the agrarian problems of the country, study their solution and propose or execute, as the case may be, appropriate measures for their solution.
- 5) Propose to the Executive Power, after appropriate studies, the declaration of Agrarian Reform zones and the approval of respective plans for expropriation, as well as the financing of the same.
- 6) Prepare plans for execution of the programs of Agrarian Reform as regards the acquisition, administration and parcelation of lands, selection and installation of recipients of land allotments, and initial organization of the economic and social life of colonization projects.
- 7) Provide technical, economic and social assistance to land recipients during the time the colonization is under the jurisdiction of the Institute;
- 8) Receive, administer and account for funds assigned to it in the form and manner specified in this law and in other laws relative

to the management of public funds.

- 9) Evaluate colonization projects being carried out by the State or by private interests.
- 10) Appoint and remove the Directors General of the National Office of Agrarian Reform and SIPA (Service of Agrarian Investigation and Promotion), Zonal Directors or Chiefs, and other personnel whose administrative category is above that of 3rd official.
- 11) Approve its budget and that of its organisms, as provided in the Organic Law of the Functional Budget of the Republic.
- 12) Enter into all classes of contracts with public or private entities, national, foreign or international, and execute all administrative acts, civil and commercial, that the law permits, for complying with its objectives.
- 13) Resolve in the final administrative instance matters that are within the competence of the Institute, and the petitions appealing against the decisions of the office of the Director General of the National Office of Agrarian Reform.
- 14) Grant land titles, as representative of the Agrarian Reform Finance Corporation.
- 15) Represent the Institute in all proceedings, of whatever nature, settle such actions or abandon them.
- 16) Prepare and publish an annual report of its activities.
- 17) Delegate to the Directors General and the Zonal Directors the functions and powers conferred by this law and its Regulations, always provided, however, that such powers are delegable.
- 18) Impose the fines provided in this law for violation or non-compliance with its provisions.

- 19) Prescribe General Regulations for the Institute and its dependencies.
- 20) Prescribe the necessary provisions for prevention of river water contamination with ore tailings; by miners or mining companies causing damage to bordering lands and killing the fish life in said waters.
- 21) Other functions, powers and duties as specified in this law.

Article 199. The National Office of Agrarian Reform (ONRA) shall consist of:

- a) Office of the Director General.
- b) Offices of Zonal Directors.
- c) Zonal Councils.

Article 200. The Office of the Director General of the National Office of Agrarian Reform shall be headed by a Director General who shall have the following powers:

- a) Exercise the representation of the Office.
- b) Direct the operations of the Office and adopt the pertinent resolutions and dispositions.
- c) Organize the Zonal Offices and install the respective Zonal Councils.
- d) Name, promote and remove the officials and employees not included in subsection 10) of Article 197.
- e) Organize programs of training for the officials, and technical and administrative employees, of his dependency.
- f) Formulate zonal projects, annual programs and budgets, as well as the annual report of activities of the Office.
- g) Comply and enforce compliance with the Resolutions of the National

Agrarian Council, with respect to the Office, as well as with his own Resolutions.

- h) Other powers specified in the law and the Regulations.
- i) Review on appeal the decisions of the Zonal Offices.

CHAPTER II

TECHNICAL COUNCIL OF AGRARIAN REFORM AND PROMOTION

Article 207. The Technical Council of Agrarian Reform and Promotion is hereby created as a consultative organ of the Executive Power and of the Institute in all matters pertaining to the application of the present law, having the following powers and duties:

- a) To examine periodically, in ordinary sessions, the activities developed by the Institute, and to formulate observations which it deems advisable.
- b) To present to the Executive Power and the Institute recommendations regarding the orientation of Agrarian Reform in the various zones, where the activities of the Institute should be extended, and the procedures that should be employed.
- c) Serve as consultant for the Executive Power and the Institute;
- d) In general, study the agrarian policy of the nation and propose measures in connection with it which it deems desirable.

TITLE XV

PREFERENTIAL RIGHTS OF FEUDATARIOS

Article 244. Yanaconas, aparceros (partners) arrendires (renters) allegados (sub-renters) colonos, mejoreros (all terms applicable to various forms of feudatory tenure or share-cropper arrangements), sub-lessees, small

lessees, and other feudatory operators of agricultural lands, upon prior payment by the Institute of the price of the land pursuant to the provisions of this law, shall be converted into owners of the parcels of land which they permanently occupy, without the necessity of the zone in which such lands are located being declared a zone of Agrarian Reform, providing, in all cases, that said parcels of land do not exceed 15 hectares on the Coast and 30 in the Sierra and Selva.

Those who occupy and operate various such parcels cannot avail themselves of the benefits of Title XV of this law except for an area which does not, in total, exceed the area specified in this Article.

Occupants of State lands in the Selva who are cultivating a minimum area of five hectares, and who have filed a claim to such land, shall be converted into owners of such parcels as they occupy, up to a maximum of 30 hectares.

Excepted from the application of this Article are land ownership units of less than fifteen hectares on the Coast and thirty hectares in the Sierra and Selva, providing, in all cases, that the owners thereof own no other rural lands.

Article 245. The Institute shall initiate immediately the appropriate legal processes to comply with the objectives specified in the preceding Article, considering the areas thus transferred as part of the quota of affectation corresponding to such owner.

Article 246. Furthermore, the Institute shall proceed to take action for the concentration of parcels and the relocation of the new owners when the necessities of efficient operation so require, and to fix the corresponding allocations of water, and to provide for the maintenance of the existing access roads.